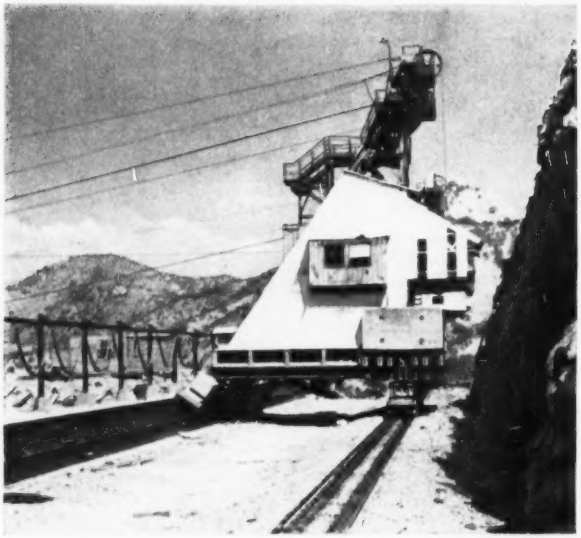
CONSTRUCTION
METHODS AND EQUIPMENT

May 1952

A McGRAW-HILL PUBLICATION



Cableway head tower, and tail tower across the canyon, are both driven on straight parallel tracks by G-E drives. Another set of towers for the service rig operates on the same tracks. Main cableway was built by Willamette Iron and Steel Co.

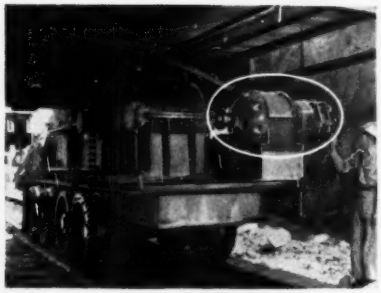
Cableway towers kept in line . . . electrically!

At Pine Flat Dam, G-E drives for movable head and tail towers prevent skewing, help keep pouring operations continuous!

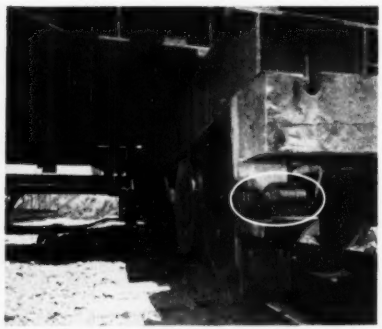
Here's an example of the versatility of electricity on construction jobs—a co-ordinated electric-drive system that helps keep an important project ahead of schedule. It's at Pine Flat Dam on Kings River in California, where a modern, high-speed G-E powered cableway—together with another rig for service functions—has set a pouring record of 4000 yards in one day.

All motors and control for the main cableway tower-drives on this Corps of Engineers dam, being built by Pine Flat Contractors Associated Companies, have been supplied by General Electric. In addition, the electric devices to keep the two cableways on the track, safely apart, and correctly aligned across the 2420-foot canyon, were all co-ordinated for the job by G-E application engineers.

This kind of engineering help—in application, installation, and service—regularly supplements G-E drives and power distribution systems, helps *you* get the most from *your* electrified construction equipment. *General Electric Co., Schenectady 5, N. Y.*



Under the head tower, this G-E 75-hp wound-rotor induction motor is one of two that drive the tower. Motors for head and tail towers are controlled by a single master switch in the operator's station.



Tower alignment is maintained automatically. This selsyn generator, connected to a head-tower wheel, and another on the tail tower, feed signals to a differential selsyn which controls speed of the tower-drive motors.

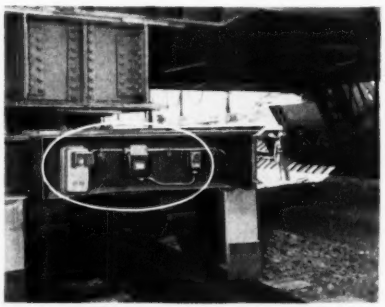


Photo-electric relays on each head tower automatically prevent the two rigs from colliding, and G-E limit switches keep towers from hitting stops at ends of the track. Thus operator can concentrate on spotting buckets.

Ask him today! **Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.**

GENERAL ELECTRIC

664-21

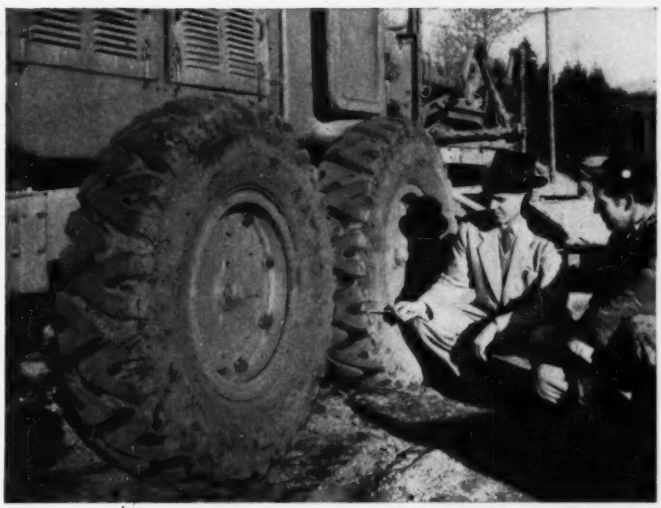
B.F.Goodrich

tires give a four-way saving to off-the-road operators

HERE'S a way you can beat rising costs and get longer tire life in spite of rugged operating conditions. Follow the lead of off-the-road operators throughout the country who use B. F. Goodrich tires— tires specifically designed to stand the gaff of the toughest jobs.

The Concrete Pipe Company of La Grande, Oregon (below), for example, uses BFG Rock tires. These tires have a tough, thick tread that resists cuts. Husky shoulder cleats give positive traction in forward or reverse gear while the center ribs lengthen tire life.

B. F. Goodrich Tractor Grader Universal tires are the choice of the N. Fiorito Company of Seattle, Washington (right). For power wheels the Universal can't be beat. Its wedge-shaped tread of specially-compounded rubber is tops for bruise resistance and full 2-way traction.



Universal Tires—*These new BFG Tractor Grader Universal tires have rolled 240 hours for the N. Fiorito Company. This operator particularly likes the non-directional Universal tread.*

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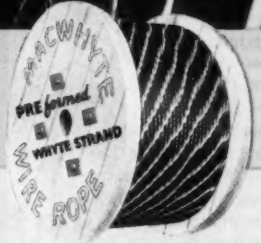

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CONSTRUCTION METHODS AND EQUIPMENT

Volume 34, Number 5 **MAY 1952** Established 1919

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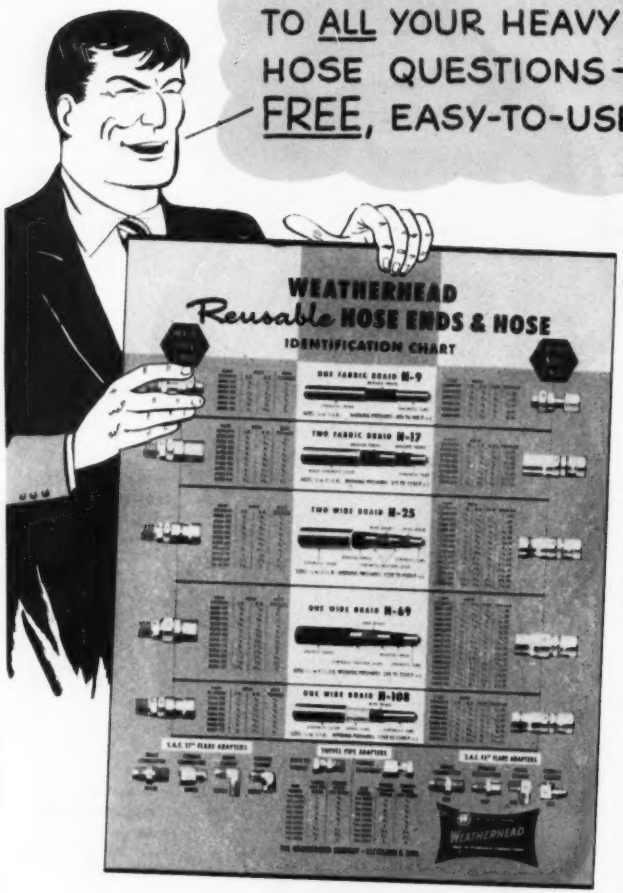

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New design includes traction drive with both forward and reverse. The drill is equipped with self-starter and generator, dual type front wheels standard equipment, and truck type rear axle with hydraulic brakes.

Automotive steering as per illustration is optional. This hi-speed horizontal drill with greater horsepower than ever before is designed to fully meet all requirements of the construction field.

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★ JOB TALK ★

. . . About Tools

Masonry Drill Bit

Designed for drilling holes from ¾ to 5-in. dia in hard masonry, Thunder-Core drill bits are carbide-tipped to cut through concrete with bluestone or granite aggregate, and even solid granite. What's more, one man can operate the drill and it's said not to bind at all. Satisfactory field tests preceded production. This is one of four types made by the **New England Carbide Tool Co., Cambridge 39, Mass.**

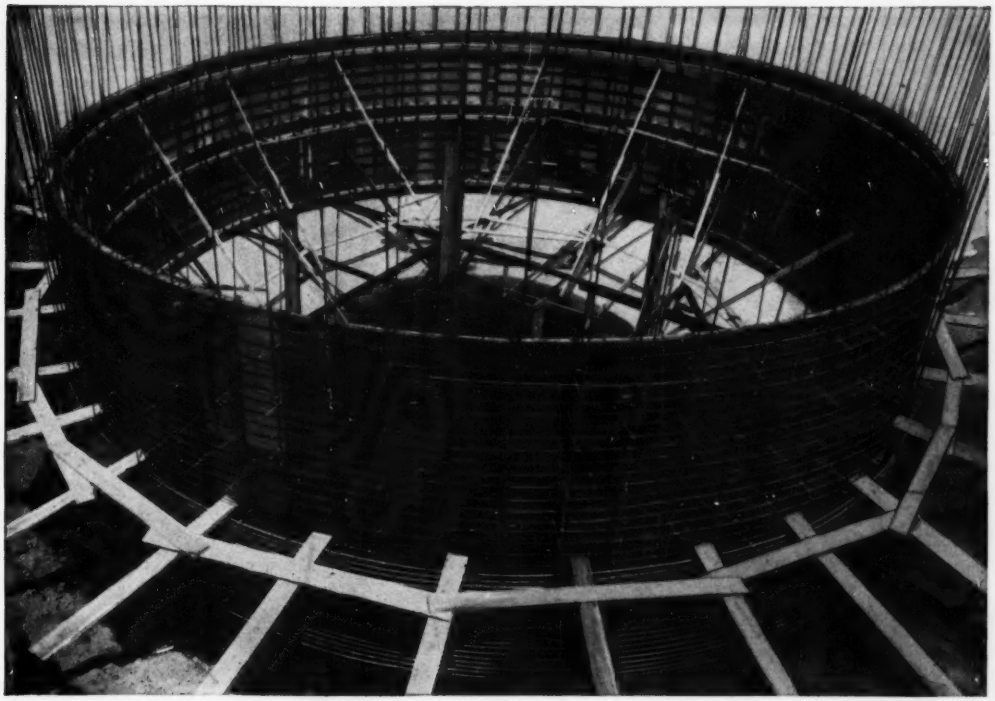
Hydraulic Bolt Cutter

Designed primarily to replace larger, more cumbersome bolt cutters, Model 200-A Guillotine weighs only 12 lb and is 21 in. long. It cuts up to ½-in. reinforcing rods with ease, and its lightness and improved handling characteristics should result in faster production and less operator fatigue. Features include a pressure of 8,500 psi and a dual-ratio pump that combines rapid traverse with high power to minimize cutting time. Minimizes tendency on the part of the operator to twist the unit while cutting, this twisting motion being the major cause of bolt-cutter breakage. Blades are of alloy tool steel and easily sharpened. **—The Manco Mfg. Co., Bradley, Ill.**

Lightweight Lever Jack

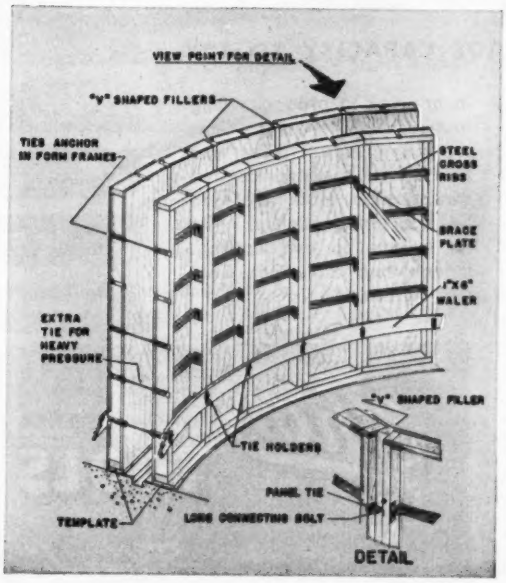
The ratchet-lowering lever jack pictured here weighs only 42 lb with its aluminum housing, but is rated for 10-ton capacity. Designed for lightweight versatility, the A1022 resembles the company's 25-ton Rol-Toe model

(Continued on page 16)



Setting Up Forms for Sewage Disposal Tank, St. Louis County, G. L. Tarlton Co., G. C.

SYMONS FORMS for CURVED WALLS



Symons Rib panels are used with V-shaped fillers at each joint. Sturdy wedge-bolts secure the three pieces together and also hold the ties in place. Curved walers (see photo) or 1" x 6" flat walers (see perspective) may be used for alignment.

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Thor ... TOOLS

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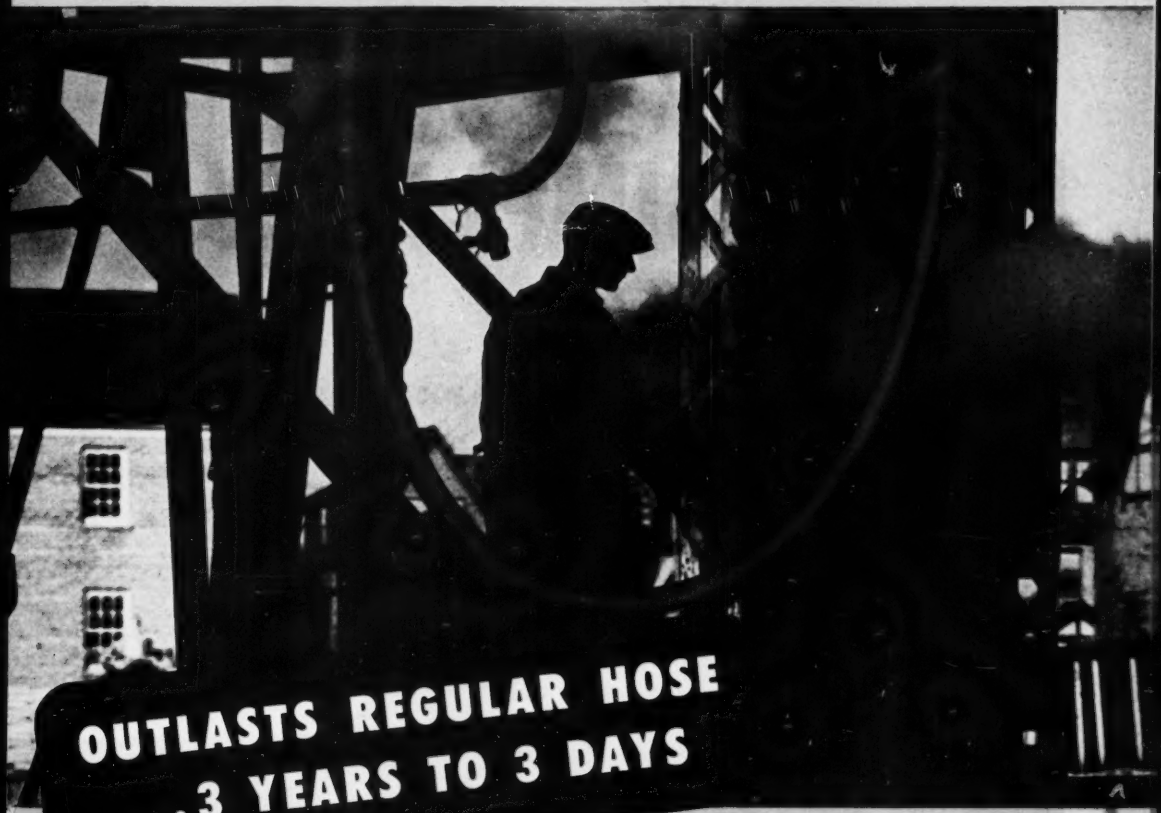

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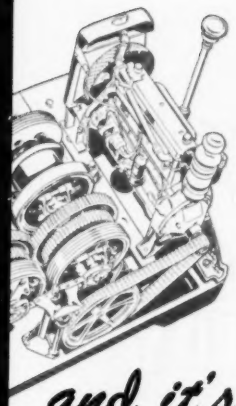

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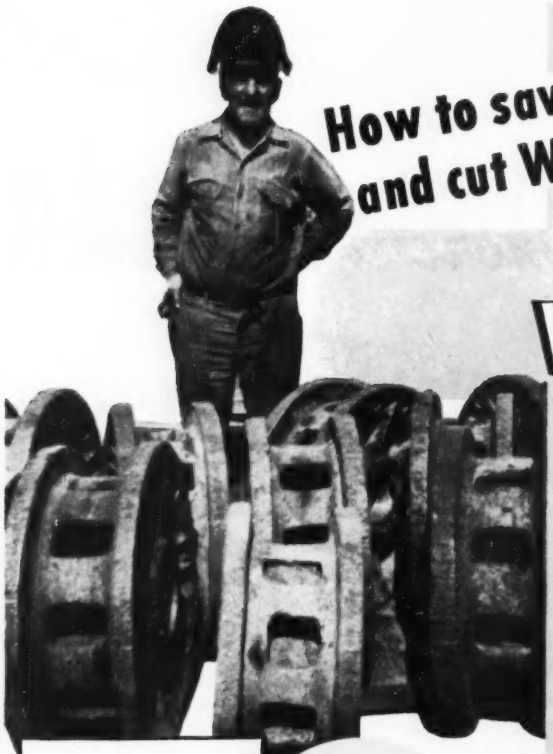

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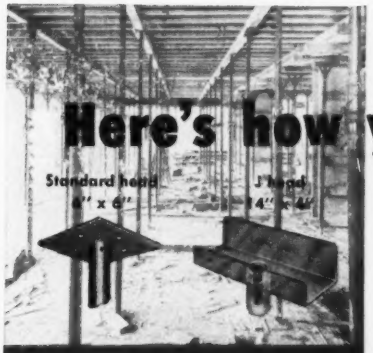


Cut Costs

ON ALL SHORING OPERATIONS

When you select ACROW Shores you save on materials—you save on time—you save on labor. ACROW Shores are easily set and accurately adjusted by only one man. Instantly adjustable from 5' 7" to 15' in their range of four sizes, ACROWS eliminate cutting, wedging, and fitting. There's 100% salvage—because ACROWS are all-steel and adjustable, and waste due to reprocessing wood shores is eliminated. Use them again and again—on any construction. ACROW Shores are simple to strip and telescope compactly for storage or transport.

Adjustable Steel ACROW Self-Cleaning Shores

GENERAL SPECIFICATIONS

Shore Sizes, Dimensions, Weights, and Capacities

Size No.	Height		Weight in lbs.	Failing Load		Recommended Safe Working Load	
	Fully Closed	Fully Extended		Fully Closed	Fully Extended	Fully Closed	Fully Extended
1	5 ft. 7 in.	9 ft. 10 in.	46	10.96 tons	8.97 tons	8210 lbs.	6720 lbs.
2	6 ft. 7 in.	10 ft. 10 in.	49	10.50 tons	7.90 tons	7840 lbs.	5975 lbs.
3	8 ft. 2½ in.	12 ft. 5½ in.	56	10.15 tons	7.55 tons	7490 lbs.	5600 lbs.
4	11 ft. 0 in.	15 ft. 0 in.	69	7.27 tons	2.89 tons	5225 lbs.	2050 lbs.

Acrow Patented Self-Cleaning Feature

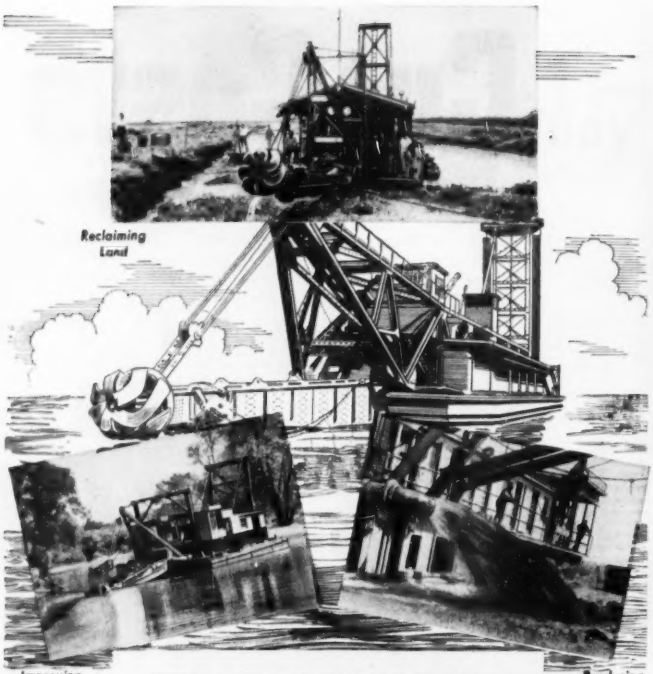
Always ready for instant use. A spur-tooth extension of the collar nut extends over a segment of the threaded tube. Turn collar handle and the encrusted concrete, dirt, and grit are cleaned away. (Illustration above.)

World's Largest Selling Shore

UNITED STATES OFFICES
Chicago, Michigan 2-1010
New York, LExington 2-7595
Boston, DEvonshire 8-7174
Philadelphia, LOcust 7-5553
Atlanta, Emerson 3716
Houston, Underwood 8514
Dallas, Riverside 6051
Birmingham, 7-5151
Los Angeles, Lomita 2889
San Francisco, ATwater 2-1442

ASSOCIATE COMPANIES
Acrow (Engrs.) Ltd., London
Acrow (Canada) Ltd., Montreal
Acrow Engrs. (Pty.) Ltd., Johannesburg
Acrow (Pty.) Ltd., Sydney
Acrow Venezuela S. A., Caracas
Acrow Brazil S. A., Rio de Janeiro
Acrow Uruguay S. A., Montevideo
Acrow Argentina S. A., Buenos Aires
Acrow Peru S. A. (Ingenieros), Lima

ACROW, INC. Dept. CM-5
510 North Dearborn Street, Chicago 10, Ill.
Gentlemen: Please send me the following free bulletins (Please Check).
☐ Acrow Shores ☐ Column Clamps ☐ Trench Jacks
Name .....
Company .....
Address .....
City ..... Zone ..... State .....



ELLICOTT DREDGES

—designed with the future in mind!

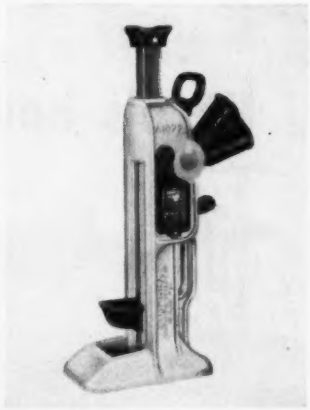
MOST dredges are purchased for a particular project. However, the extent to which the dredge you buy may be readily and economically adapted for other jobs in the future determines the soundness of your investment.

Sometimes a particular dredging job requires an extremely specialized machine. But in most cases, Ellicott-built dredges can be made versatile enough to have a useful life in many varied operations. Filling land . . . maintaining and improving channels and harbors . . . digging canals . . . desilting . . . building dams . . . producing sand, gravel and shell . . . all can usually be done by the same Ellicott Dredge, with but relatively few alterations.

Because Ellicott Dredges are designed with the future in mind, your investment is protected. You can be sure that the dredge Ellicott engineers design for you will serve you for many productive and profitable years. What's more, Ellicott's years of experience is further assurance that your dredge will *outperform all others on every basis!* For more information, write for Catalog 825. Address: ELLICOTT MACHINE CORPORATION, 1605 Bush Street, Baltimore 30, Md.

ELLICOTT®

ELLICOTT DREDGES



(CM&E Feb. '52, p. 132), and the minimum height of its toe is only 2 in. This same toe lifts the jack's full-rated capacity through a 12-in. lift. Jack top minimum height is 20½ in.

Other features of the Simplex line included in the lightweight model are drop-forged parts, double-lever sockets, shorter fulcrum centers, adjustable, cadmium-plated links and springs, multiple-toothed pawls and lubricated trunnion bearings.—**Templeton, Kenly & Co., 1020 S. Central Ave., Chicago 44, Ill.**

M-Scope Locates Hidden Beams

The fellow in this picture isn't hunting for uranium or some other precious metal with a Geiger counter. He's a construction employee using a T-10 M-Scope to locate a water line, electrical box or beam, which may be hidden in the brickwork of the circular wall. Later on he may use it to locate a man

(Continued on page 22)

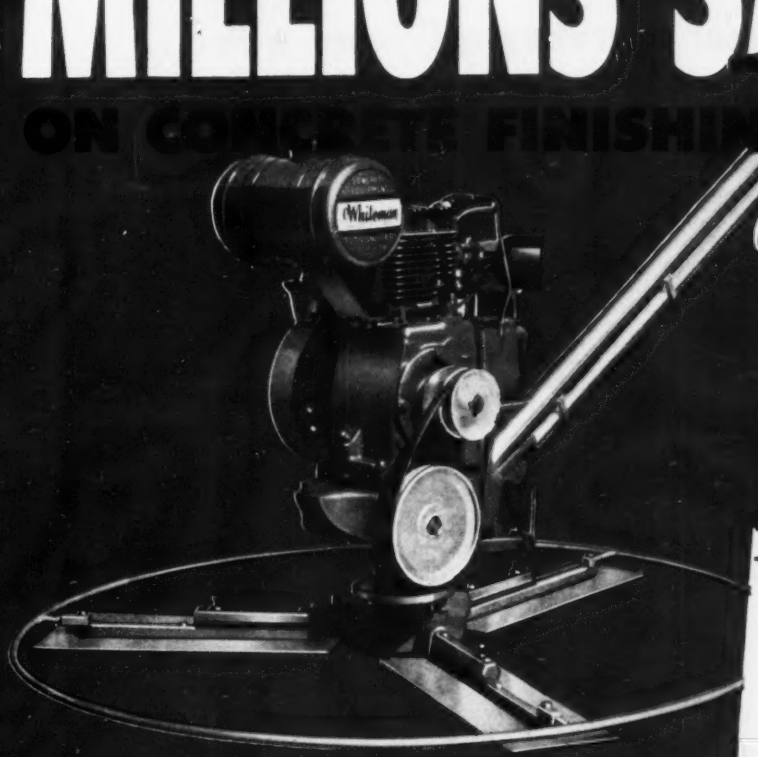
MILLIONS SAVED

ON CONCRETE FINISHING...

with

Whiteman

FLOATING-FINISHING MACHINES



IN USE 10 YEARS! STILL GOING STRONG

ROBERT E. McKEE
GENERAL CONTRACTOR INC.

Los Angeles 46, California

Whiteman Manufacturing Company

Gentlemen:

The Whiteman Floating-Finishing Machines which we bought 10 years ago are still in use and doing a good job. We have purchased many more of these machines and find them to be highly efficient, dependable and great time and money savers on the job.

Very truly yours,

ROBERT E. MC KEE
GENERAL CONTRACTOR, INC.

By

LW:tu
cc EP

During the past 15 years, Whiteman Floating and Finishing Machines have saved millions of dollars in construction costs for contractors the world over. Constantly improved over the years, the new Model "B" is finer, more powerful than ever. Heavier 1" spider arms maintain uniform pressure for the full width of trowels. Patented "snap-on" trowels for floating. Both sides of finish trowels are used—not just one. New Whiteman centrifugal clutch tightens belt automatically. Trowel pitch is easily adjustable when machine is in motion... another exclusive Whiteman feature. Gas engine or electric motor. Also available in Model "J" for smaller operations. You, too can save on concrete finishing! Send coupon for prices and literature.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for ☐ Screeding Machines. ☐ Power Buggy ☐ Floating Finishing Machines.

Name_____
Firm_____
Address_____
City_____ Zone____ State_____

. . . on every job you set new standards of compressor operating efficiency with . . . .

DAVEY

Davey Model 160 Diesel in service of Ray D. Baker Contractor, Inc., Detroit . . . on Consumers Power Co. job, Royal Oak, Mich.

Davey Model 105 trailer on water line job in Kent, Ohio.

TODAY—more than ever before—efficient equipment holds the sure key to successful construction and maintenance work.

That's why it will pay you to find out the facts about Davey before you buy any compressor.

Every Davey Compressor is equipped with *Permanent Peak Efficiency* lifetime valves. These never carbon or foul . . . do not require cleaning or replacement . . . keep tools operating at full capacity. A-5100

Davey Field Service Unit owned by Borough of Manhattan (N.Y.) contains complete repair and maintenance equipment. Model 105 Davey "Auto-Air" Compressor and 300 ampere, 8 k.w., combination welding and power generator are among main items.

DAVEY

pioneers of "air-cooled air"

DAVEY COMPRESSOR CO. • KENT, OHIO

Flood control levee gets a lift from "Caterpillar" power

BUILDING a 13-mile section of flood control levee in the Florida Everglades, Hooper Construction Company of Coral Gables relies heavily on "Caterpillar" equipment. A D17000 Engine powers the Link-Belt Speeder 2½-yard Dragline. A D8 Tractor with No. 8S 'Dozer works with the dragline. And two D13000 Engines with two Gardner-Denver 500-foot compressors on tracks, pulled by a D6 Tractor, provide the blast hole power for shooting coral rock. In all, Hooper's "Caterpillar" lineup includes 12 tractors, 5 motor graders and several engines.

On this project, holes are drilled 14 feet deep and shot 72 at a time, each shot loosening about 30 cu. yds. of coral. 260,000 cu. yds. are excavated a month. The resulting canal is 75 feet wide and 14 feet deep.

Like Hooper, many other contractors have found that it pays to standardize on "Caterpillar" units. They are engineered for steady performance with a minimum of down-time. As sturdy as they are, they'll do even *more* work at *lower* cost if given good care. You don't have to coddle them — proper maintenance takes only a few minutes a day. And remember, your nearby "Caterpillar" Dealer has the facilities for specialized service — any time you need it, call on him!

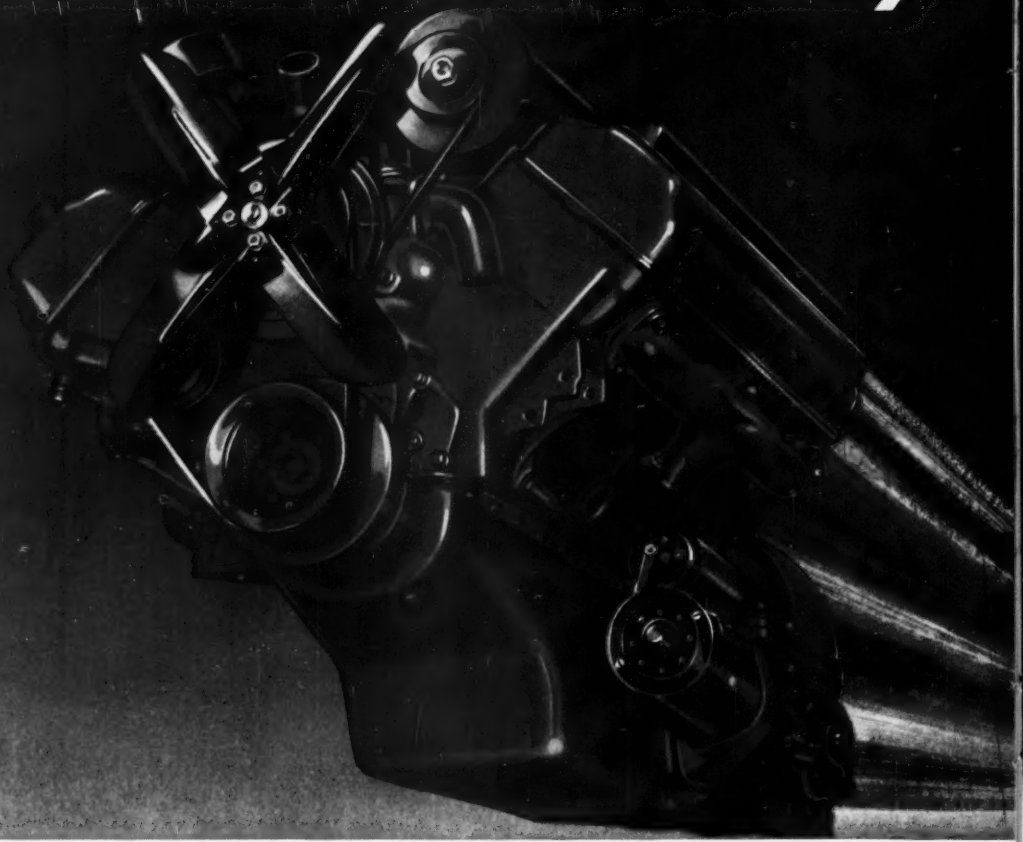
CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

NOW!... a Revolutionary



Chrysler Industrial Engineers Again Shatter Precedent! Develop Advanced Design With Larger Bore and Ingenious New Overhead Valve Arrangement! Make Long-desired Hemispherical Combustion Chamber Practical For Mass Production Methods

To the long list of Chrysler "Engineering Firsts" now is added another!

For many years, engineers have known that the Hemispherical Combustion Chamber produces the highest volumetric and thermal efficiency, exceptionally good combustion characteristics, and had excellent adaptability to high compression ratios. But all previous attempts to incorporate this design into a mass-produced engine had been unsuccessful. After five years of intensive research, Chrysler Engineers attained this goal.

With only 2.3 per cent more displacement, this mighty new Chrysler Industrial V-8 delivers *33 per cent greater maximum horsepower and a 16 per cent higher maximum torque.* Its performance is incredible. Its fuel economy is outstanding. Its durability unexcelled. In operation, it is amazingly smooth and quiet. Over-all efficiency is tremendously increased.

NEW CHRYSLER INDUSTRIAL

Yet, it has greater compactness and less weight.

Among its unique design features are a water jacketed throttle body that prevents "icing," integral automatic choke and double breaker ignition distributor.

This sensational new Industrial Engine will give you a whole new conception of industrial power and Industrial Engine performance.

Let us show you what it will do for *you*. See your Chrysler Industrial Engine Dealer, or if your job involves special engineering, write us direct. **Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Avenue, Detroit 31, Michigan.**

CHRYSLER
Industrial Engines

HORSEPOWER WITH A PEDIGREE

Jobs like these are "naturals" for your Jaeger Aggregate Spreader

Laying granular sub-base, Pennsylvania Turnpike
(12" compacted blanket of crushed shale laid in 2 courses, each 8" thickness before compaction, 12' wide.)
Jaeger Spreader is ideal for laying all base and surface aggregates — up to 12" thickness in widths to 11', lesser thicknesses to 12½'.
Note that all traction is on the subgrade
No displacement of newly laid material. Straightedge runners, carrying the strike-off, average out subgrade irregularities, insure smooth, accurate spread.

A Jaeger Aggregate Spreader, with either crawler or 4-wheel traction (interchangeable to suit subgrade conditions) costs only half the price of a bituminous paver. With it, you can lay all types of aggregates, plant-mixed stabilized soil or free-flowing bituminous mixtures, either hot or cold, in a much greater range of widths and thicknesses, as fast as your trucks can deliver and with the accuracy required for highway, street and airport base, and both base and top for secondary roads, parking areas and drives. Machine blends joints, places flush to curbs. Two models, to suit any size of trucks.

For details, see your Jaeger distributor or send for Catalog SPS-1

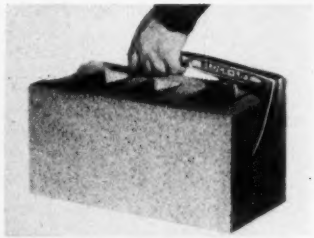
THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • PUMPS • MIXERS • HOIST TOWERS • PAVING MACHINES

JOB TALK ... Cont. from p. 16

hole that's been covered with asphalt, or to trace the path of bent conduit tubing in a concrete floor to minimize breakaway for a new connection. Metal objects such as these are identified by a distinctive change in earphone tone, as well as by indication on a visual meter. Easily adjustable for operation with either hand and quickly dismantled for storage or transportation, the 7-lb unit has located handily small metal objects lost in soil, snow, wood, plaster and fresh or salt water.— **Fischer Research Laboratory, Inc., 1963 University Ave., Palo Alto, Calif.**



Building Block Lifter

Weighing only 14 oz, as compared with its forerunner of 32 oz, this concrete and cinder block lifter will fit 98% of all line blocks, lifting 16-inchers in widths of 4, 6, 8, 10, and 12 in. It will not pick up quarters, splits or bats, but makes handling for both bricklayers and tenders a comparatively effortless job, saving hands, gloves and back.— **Block-Lift Co., Inc., 1605 14th St., Cuyahoga Falls, Ohio.**

Tape for Service Lines

The tape being wrapped around this joint is a new polyvinyl type with exceptional dielectric and insulation properties. The 10-mil Dressertape has an insulation resistance of 100,000 megohms and dielectric strength of 10,000 v. It provides effective protection against water, salt water, acids, alkalis, oil and soil chemicals.

Conforms readily to irregular surfaces, is especially adaptable for the

(Continued on page 32)

NEW

THE WORLD'S BIGGEST LOADING SHOVEL

MARION 191-M
10 cubic yards

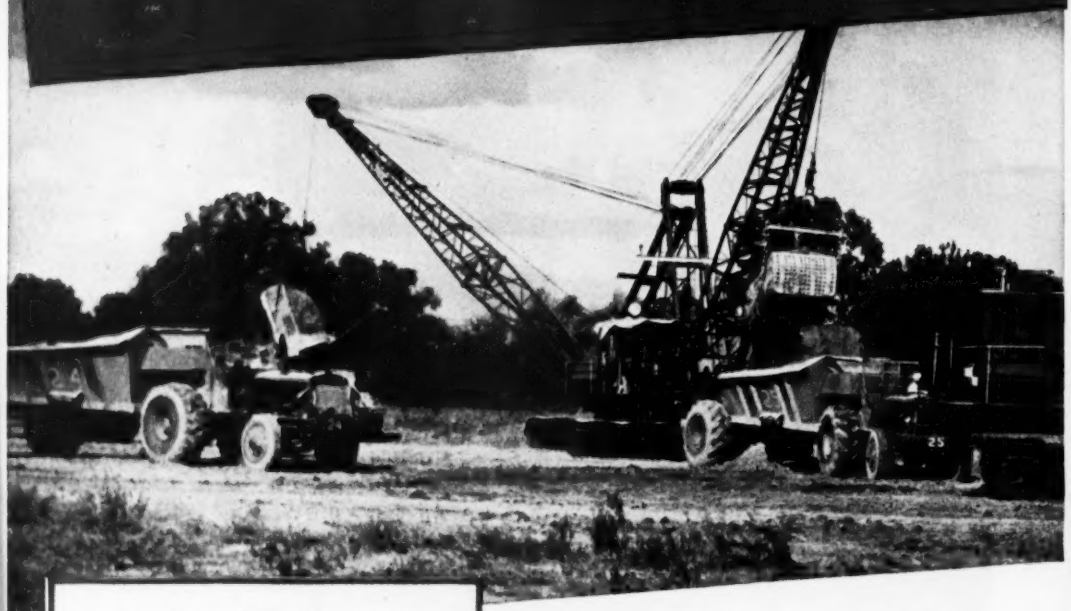
- Loads trucks in the 50-ton class in 3 or 4 passes to meet big haulage problems.
- Big enough to load gondola rail cars quickly.
- Greater travel speed and maneuverability than most of smaller machines.
- All-electric or diesel electric power; Ward-Leonard control on both.
- A 10 cu. yd. heavy-duty shovel with small-machine cycle time.
- Largest two-belt crawler shovel built.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd. to 45 cu. yds.

"TEXACO URSA OIL X** OUR DAM WORK



Construction equipment, lubricated and fueled with Texaco, at work on the Morganza embankment, part of the flood control program on the lower Mississippi. Joint contractors are Edward E. Morgan Co., Inc., and Jones & Gillis, Inc. Dirt-moving operations, started in June, 1949, call for placing 3,985,000 cubic yards of semicompacted embankment. Equipment includes 4 draglines, 9 tractors and 53 trucks — all of which are lubricated with Texaco exclusively.

HEAVY rains slowed early stages of placing nearly four million cubic yards of embankment for the Morganza Control Structure. Construction machinery was idled for days at a time. This made it vital that, when work could be resumed, there be no delays due to equipment failure.

"Diesel engines in all our earth-movers," report the contractors, "were lubricated with *Texaco Ursa Oil X***. They ran perfectly even under the severe conditions often imposed. We found, on this as on other jobs, that *Texaco Ursa Oil X*** is a big help

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

TEXACO

TEXACO

HELPS US KEEP ON SCHEDULE"

—say Edward E. Morgan Co., Inc. and Jones & Gillis, Inc.

in reducing fuel consumption and keeping maintenance costs low."

*Texaco Ursa Oil X*** cleans as it lubricates. Its fully detergent and dispersive properties keep harmful carbon, sludge and gum from forming. Better compression and combustion result, wear is reduced, bearings are protected against corrosion. Engines run better; parts last longer.

Let a Texaco Lubrication Engineer tell you more about *Texaco Ursa Oil X*** and how you can reduce your costs with the Texaco Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Make Savings Here, Too—Chassis parts last longer when protected by *Texaco Marfak*. This super-tough lubricant guards against wear and rust in the most severe service. *More than 400 million pounds of Marfak have been sold.*

Wheel bearing maintenance cost is less when you use *Texaco Marfak Heavy Duty*. It seals itself in, seals out dirt and moisture. No seasonal change required.

Crawler track bearings give long, trouble-free service when lubricated with *Texaco Track Roll Lubricant*. Protects against wear, dirt and moisture.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours 50 *for Fifty Years*

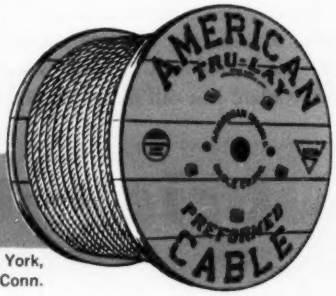
an ACCO product

TRU-LAY Preformed WIRE ROPE

● For each use there is *one best* wire rope . . . one that will stand repeated loading, abrasion, crushing, or continuous bending, and be the best rope to buy.

To achieve this, there is a TRU-LAY Preformed Wire Rope made in a special construction for your equipment. This construction has the exactly right combination of strength, bending life, and resistance to wear and crushing that you need.

The one best wire rope . . . TRU-LAY Preformed . . . will last you longer and cost less to use. Specify and get TRU-LAY Preformed improved plow steel—the rope identified by the Green Strand.



ACCO

TRADE MARK

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

NEW!
THE TR 200
REAR DUMP
MOTOR WAGON

TR 200 MOTOR WAGON SPECIFICATIONS

Here's your *NEW* LaPLANT-CHOATE *ROCK WAGON*

HERE'S a new addition to the well-known LaPlant-Choate line of Motor Wagons and Earthmovers. The 18-ton TR 200 is a hydraulically-controlled rear dump wagon flexibly joined to the same big rubber-tired tractor so successfully used on the LaPlant-Choate TS 200 Motor Scraper. It combines rugged power, big capacity and high speed with a host of other features to make this unit outstanding in its field.

FEATURES YOU'VE BEEN LOOKING FOR IN A REAR DUMP WAGON

- **Stable wheel base assures absolute safety when dumping over edge.**
- **Rock Lug tires.**
- **Protected cab.**
- **Your choice of two diesel engines in the T 200 Tractor . . . a 176 HP Buda or a 165 HP Cummins.**
- **No obstructions in the wagon body.**
- **Tilts to 70° from horizontal.**
- **Full hydraulic control.**
- **Rear dump advantages.**
- **Available with heated body for use in cold climate to prevent freezing of material in load.**

GENERAL

CAPACITY	
Struck, cu. yds.	11
Heaped, cu. yds.	15
Tons	18
OVERALL DIMENSIONS	
Length	25'9"
Width	10'7"
Height	10'0"
WHEEL BASE	13'7"
WHEEL TREAD	
Tractor	6'8"
Wagon	8'8"
TIRES	4—21.00 x 25—24 ply rock lug
BRAKES	
4-wheel air Timken-Detroit	18" x 7"
TURNING	
Width required 180° turn	31'3"
Degree of turn each way	60°
HYDRAULIC SYSTEM	LPC Fluid Power Unit
Steering—25 GPM	Model HU25
Wagon operation—40 GPM	Model HU40
SHIPPING WEIGHT	
(Approx. in lbs.)	40,000

T 200 TRACTOR

ENGINE	
Buda Diesel Model 6-DA-779	176 HP
or	
Cummins Diesel Model HRB-600	165 HP
ENGINE CLUTCH	17" Lipe Rollway
TRANSMISSION	Fuller 5A1120
SPEEDS	
(at 1800 RPM—MPH)	From 2.46 to 21.63
STARTING METHOD	Electric 24 V
AIR COMPRESSOR	
Bendix-Westinghouse	7¼ cu. ft. capacity
ELECTRIC SYSTEM	12 V
FUEL TANK CAPACITY—U. S. gallons	70

R 200 WAGON

MISCELLANEOUS DIMENSIONS	
Loading height, rear	5'6"
Loading height, side	8'3"
Bowl width	8'0"
Bowl depth, maximum	4'8"
Bowl length	11'3"
OPERATING METHOD	
Type of ejection	Rear dump, hyd. lift
Number of jacks (double acting)	2
Size of jacks	8" x 31"
DUMPING ANGLE	70°

LAPLANT CHOATE

MANUFACTURING CO., INC. — CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

3- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

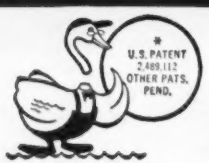
Hydraulic and Cable-operated Dozers.

THE MAN SAID

Shown here is Van Haaren & Sons of Bay City, Mich., ready to give a heavy transformer a safe, easy ride on their Talbert Removable Gooseneck* Trailer. The Talbert Trailer provides minimum road clearance and minimum load height.

"Put it on Springs for a safe, easy ride . . . Put it on a TALBERT TRAILER"

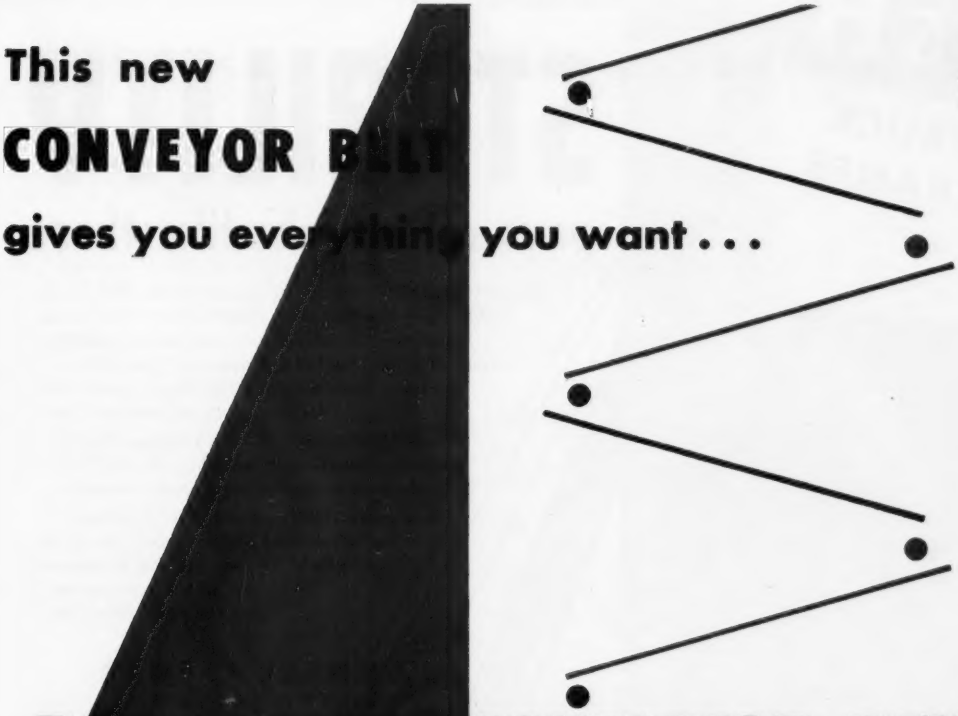
Talbert's six key men are licensed pilots. The Talbert Company keeps its two Cessna planes in constant use through its progressive service and sales program.



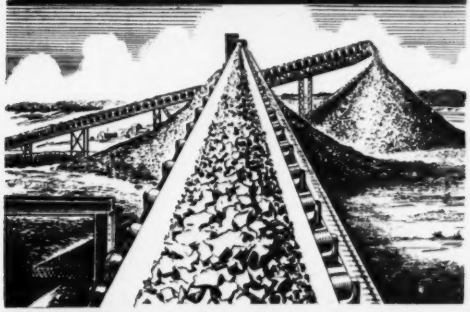
THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

This new CONVEYOR BELT gives you everything you want . . .



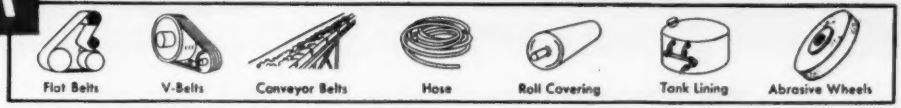
RAY-MAN "F" CONVEYOR BELT



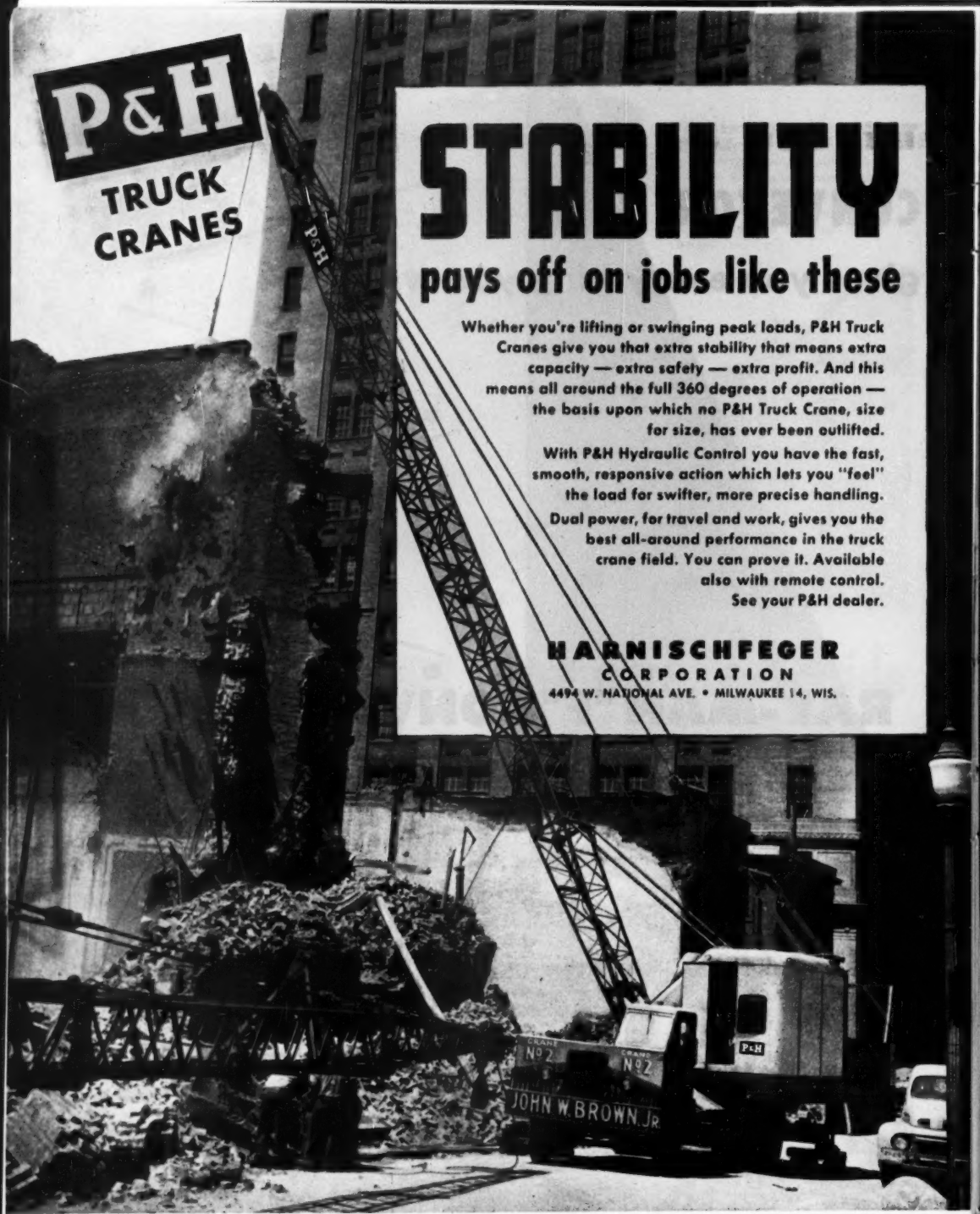
Users asked for a conveyor belt to stand up where there is exceptional tendency to tearing or puncturing . . . where pulleys are relatively small . . . and yet where only a thick, narrow belt could be used. It must hold fasteners better too. R/M engineers solved this combination of tough problems with Ray-Man "F", the new conveyor belt using unique properties of synthetic fibre strength members • Ray-Man "F" also gives you everything you ask for in a general purpose belt — troughability, flexibility, resilience for shock loading, better cover adhesion. It naturally follows that you get longer service than you ever thought possible in a conveyor belt • Bulletin 6915 describes it fully. Write for your copy . . . The R/M representative can show you equally good engineering in R/M hose, transmission and V-belts.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls



STABILITY

pays off on jobs like these

Whether you're lifting or swinging peak loads, P&H Truck Cranes give you that extra stability that means extra capacity — extra safety — extra profit. And this means all around the full 360 degrees of operation — the basis upon which no P&H Truck Crane, size for size, has ever been outlifted.

With P&H Hydraulic Control you have the fast, smooth, responsive action which lets you "feel" the load for swifter, more precise handling.

Dual power, for travel and work, gives you the best all-around performance in the truck crane field. You can prove it. Available also with remote control. See your P&H dealer.

HARNISCHFEGER
CORPORATION
4494 W. NATIONAL AVE. • MILWAUKEE 14, WIS.

P&H Power Shovels and Truck Cranes are more easily converted for various types of service because hoist and digging drums are on one shaft. The need for auxiliary shafts and gearing is eliminated. Write for literature on the size you need. Sizes up to 8 cu. yds., gasoline, diesel or electric power.

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Send for YOUR copy of this valuable book

96 pages of up-to-date information in handy pocket size!

JUST OFF THE PRESS, the new revised edition of this popular Guide is chock-full of the latest facts on how to properly lubricate and maintain your equipment.

As its title implies, this informative book suggests the proper lubrication and maintenance of contractors' equipment. In addition, it covers similiar types used by quarries, crushed stone plants, sand and gravel, and other operations.

It has been especially prepared by Gulf Lubrication Engineers with the sincere hope that it will prove helpful to you and your organization. It is easy to read and authentic in every detail. For your copy of this useful book, mail the attached coupon.

GULF

Gulf Oil Corporation · Gulf Refining Company

719 Gulf Building, Pittsburgh 30, Pa. CM

Please send me, without obligation, my free copy of the new revised edition of "Lubrication and Maintenance Guide for Contractors' and Allied Equipment."

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Company .....

Title .....

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"EVERY DAY WE FIND A NEW USE FOR *Ramset*"

says Mr. F. A. Birkhauser,
Purchasing Agent,
Hutter Construction Company,
General Contractors,
Fond du Lac, Wisconsin.

"It is a great timesaver for fastening steel and wood to concrete."

You can cut costs up to 75% and time up to 90%, for fastening into steel and concrete with simple, strong, easy-to-use RAMSET® TOOLS and Tru-Set Fasteners. More contractors rely on RAMSET than on any competing method. They know from long experience that RAMSET gives them more effective fastenings, better service, saves more time and money, on every job.

New Tru-Set Fasteners, at lower cost, bring added speed and economy. The elasticized Red-Tip Pilot guides the fastener straight and true to the work, on the spot where it's wanted.

Versatile RAMSET SYSTEM can be profitably applied to hundreds of fastening jobs. See your local dealer or write us today for details on how its amazing performance saves time and reduces costs.

Ramset Fasteners, Inc.

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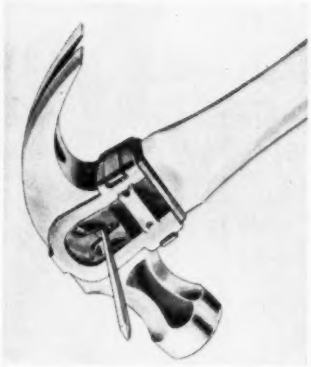
Product Patent No. 2470117. Other Patents pending

JOB TALK . . . Cont. from p. 22

protection of fittings on service lines. Applied cold, it is safe for workmen to handle, even in cramped ditches. It can be backfilled immediately since it needs no setting-up period. Now offered in the 10 mil thickness, 2 in. wide, it soon will be supplied in a variety of sizes to meet all pipe and pipe joint requirements.—**Dresser Mfg. Div., Bradford, Pa.**

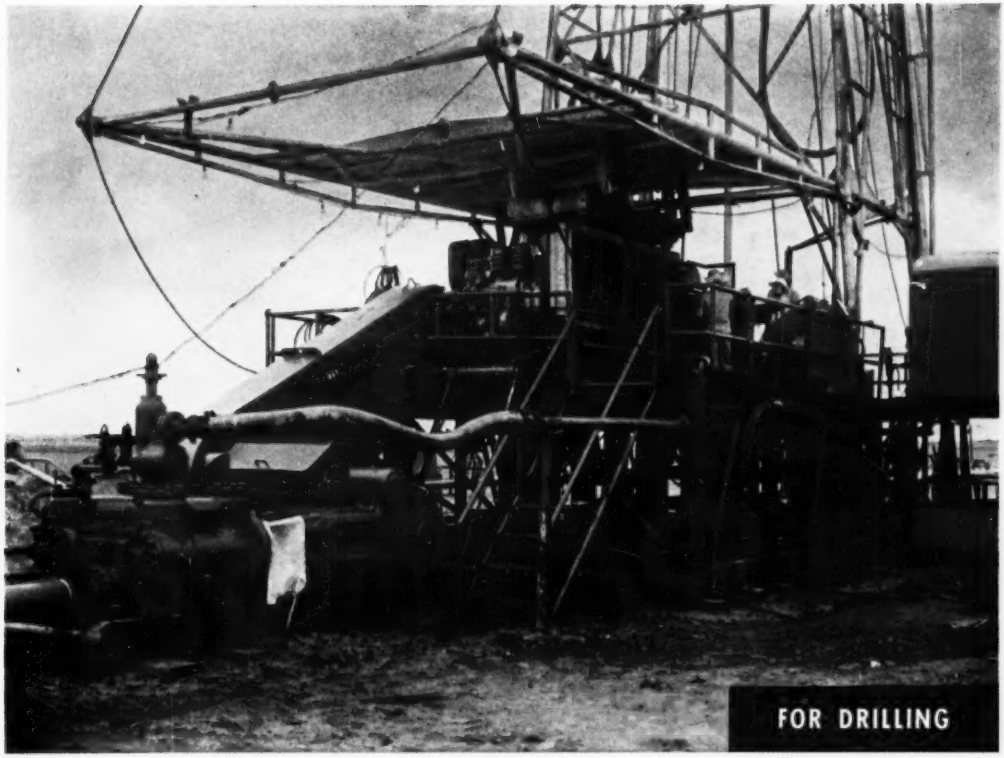


Nail Holder for Hammer

The nail clip mounted on the head of the hammer is known as a "third hand" and allows free use of one hand while starting a nail. In addition, it provides a hammer's-length extra reach which comes in mighty handy for form work, ceiling work, roof framing and scaffolding work. There's a steel clip on each side which will hold anything from shingle nails to 20d spikes.—**Amsco Co., Dept. CME, Le Center, Minn.**

Stopwatch and Rpm Counter

This combination stopwatch and revolution counter will check the speed of motors, shafts and machinery. It may be pressed slightly against a revolving shaft and left idling. A sudden increase in pressure will engage both counter and second hand simultaneously. When released after 15, 30, 45 or 60 sec, revolutions per time interval can be read directly from the same dial. A turn of the knob not only resets the counter to zero, but also winds the stopwatch at the same time. Gears and drives are solid brass, and maximum speed is 5,000 rpm.—**Montgomery & Co., Inc., 53 Park Pl., New York, N. Y.**



THIS IS THE DIESEL

for any job from 32 H.P. up

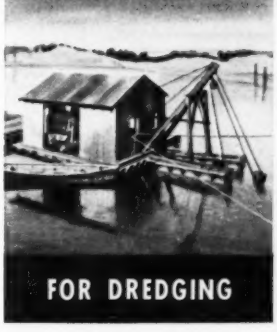
Here's the Diesel that has changed a lot of old ideas. It has brought new standards of economy and efficiency to scores of jobs where Diesels were never used before—down to operations requiring as little as 32 horsepower.

This General Motors Diesel packs more power in less space. It actually takes up little more room than gasoline engines of comparable horsepower—and is even simpler to operate.

It outworks other engines of its size because high compression 2-cycle operation makes it faster-accelerating, quicker to respond to varying loads.

It slashes costs! Besides traditional Diesel fuel economies, the GM Diesel engine costs less to maintain. *In applications where GM Diesels have replaced gasoline power, owners report savings of 40% to 70% on fuel and maintenance.*

Your GM Diesel distributor will gladly show you how this modern Diesel power can step up your production and cut your costs. You'll find it's available in more than 750 different models of machines. Ask him for the facts, or write us.



DETROIT DIESEL
ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines... 32 to 275 H.P. Multiple Units... Up to 800 H.P.

GM
GENERAL MOTORS
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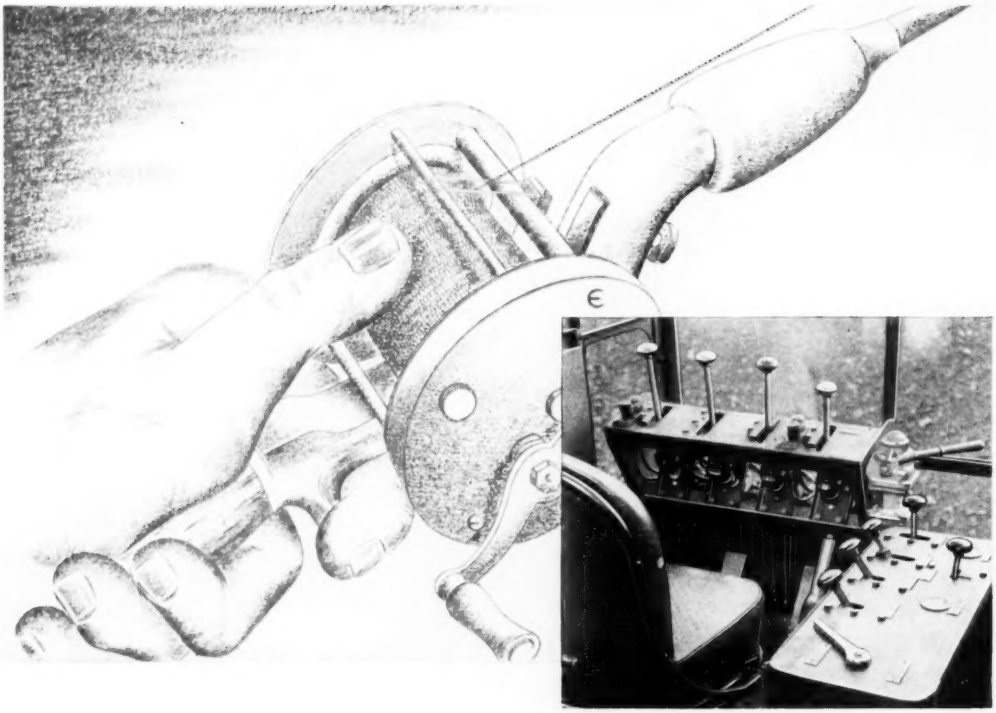
POWER



Complete Command of Operations . . .

Right under your thumb

With LIMA precision air controlled clutches and brakes you get the same smooth, easy, responsive control of the hoist and drag lines that you do when you apply the under-the-thumb tension to the line on a fisherman's reel.

There are other advantages, too. LIMA precision air control promotes long life of the machine and uniformity to the operating cycle. It also automatically compensates the adjustments of the clutches for wear of lining and to meet weather and operating conditions.

Last (but by no means least), there's no mid-afternoon slowdown because of operator fatigue. Both man and machine can work at peak level for the entire shift.

LIMA SHOVELS are available in capacities from ¾ to 6 yards.

LIMA CRANES are available in sizes to 110 tons capacity.

LIMA DRAGLINES are available in variable capacities to suit specific needs.

Wheel or truck mounting is available on machines of ¾ and 1½ yards capacity.

BALDWIN-LIMA-HAMILTON CORPORATION
LIMA-HAMILTON DIVISION
LIMA, OHIO

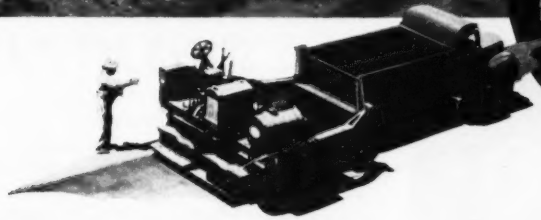
OFFICES IN PRINCIPAL CITIES OF THE WORLD

BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

BALDWIN BLH LIMA-HAMILTON

The best BLACK TOP PAVER to own— and WHY!



IT IS the all 'round ability and versatility that makes a piece of equipment profitable—versatility that will keep it busy earning money—one kind of job today, another tomorrow!

Your Adnun Black Top Paver brings you a design that assures lower cost operation and makes possible the handling of a range of jobs no other similar piece of equipment can do.

- ★ Your Adnun is the only black top paver unconditionally recommended for laying all asphaltic mixes and spreading any type of aggregate. The Adnun will spread aggregate at lower cost than by blade and tail gate.
- ★ With Adnun retractable wheels it can be moved speedily and easily under its own power or by truck tow.
- ★ Continuous Course Correction means smooth pavement automatically and instant correction of error. With mechanical control you are assured of the maintenance of adjustments.
- ★ Overlapping Cutter Bar action makes the Adnun the only black top spreader that assures a positive joint under pressure—safer driving for the public.
- ★ Solid construction eliminates repeated rebuilding. Modern design reduces adjustment. Electric Screed Heater eliminates danger of poorly protected oil burners to crew.
- ★ Wheel Steering and positive traction on both front wheels and rollers along with greater engine horsepower, gives easier control and greater accuracy.
- ★ Adnun gives a wider range of course width and has laid up to 13'ft.

These are but a part of the many advantages that Adnun offers. Get more details. Ask for the booklet, "11 Basic Things . . ." It may give you some new thinking on Black Top Pavers.

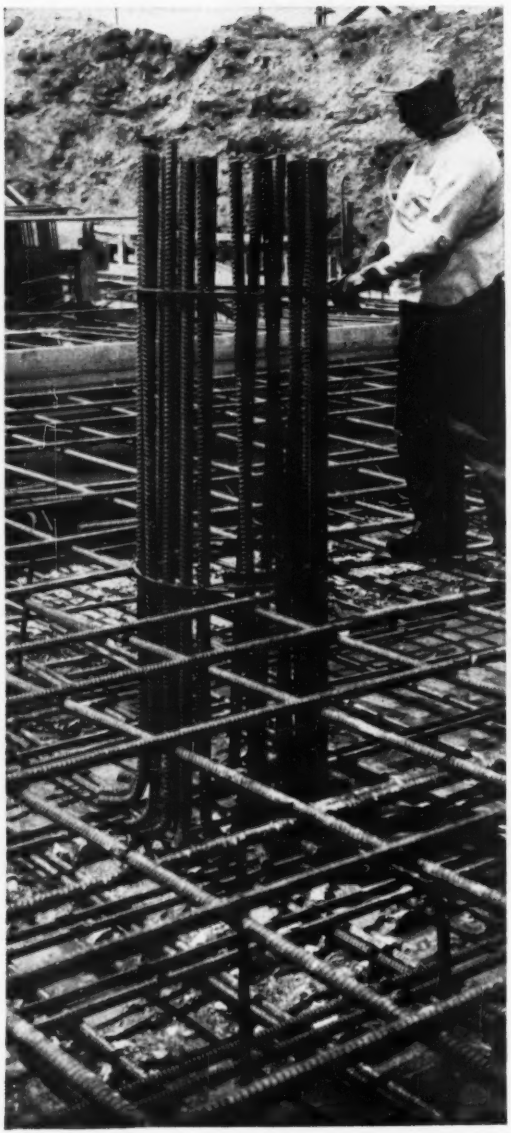
THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1922 State Street, Nunda, New York

BLAW-KNOX PRODUCT

ADNUN
TRADE MARK REGISTERED

BLACK TOP PAVER

CONSTRUCTIVE



INLAND HI-BOND

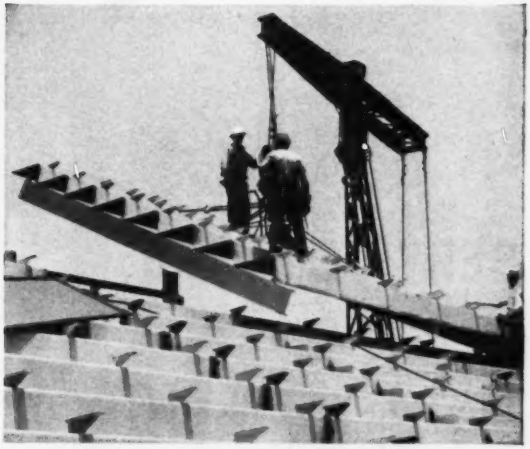
The deep, reversed, double-helical ribs of Hi-Bond reinforcing bars provide a mechanical grip which gives maximum bond in concrete, thus permitting greater use of steel's potential strength in concrete construction. It also improves transfer of stresses, crack control and resistance to slip . . . advantages that will make possible higher design stresses and thereby lower construction costs. Hi-Bond meets standards set up by ASTM A 305.

INLAND STRUCTURAL SHAPES AND PLATES

Inland's service on structurals and plates meets the most exacting requirements of today's construction and heavy equipment industries . . . in dependability of product and engineering cooperation with users. I-Beams, Angles, Channels and other standard structural sections, in a wide range of sizes, are rolled to all the standard specifications . . . also in Inland Copper-Alloy for increased resistance to atmosphere corrosion.

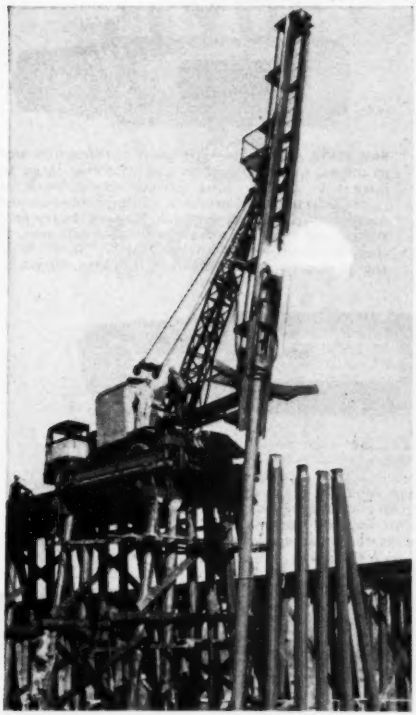
INLAND

IDEAS



INLAND 4-WAY SAFETY PLATE

On scores of products, on new bridges, in new buildings—and for replacement, maintenance and repair—this scientifically designed steel floor plate, with its exclusive raised lug pattern, provides positive traction in every direction. Tough, durable, strong, it stands up under heavy loads and hard wear. It can be readily sheared, welded, punched, flame cut, and shaped. It has no pores, no cracks, absorbs no liquids and is easy to sweep. Comes in a wide variety of patterns and sizes. Write for Bulletin FI.



INLAND CREOSOTE OIL

For better, longer-lasting preservation of timbers and wood piling. Inland-owned-and-operated coal mines, coke ovens and tar distillation equipment assure quality control at every step in production of Inland Creosote Oil. Its low benzol insoluble content of about 0.1% (American Wood Preservers Association specifications permit 0.5%) gives clean, deep-penetrating, longer lasting preservation.

INLAND SHEET PILING

Taking the punishment of driving and pulling—being driven, pulled and re-driven as many as 15 times—Inland Sheet Piling has been used and depended on by piling contractors for more than 25 years. Made with highly efficient interlocks for water retention, it gives excellent service on single and double wall cofferdams, cellular breakwaters, jetties, docks, bulkheads and retaining walls. Rolled from a special analysis steel, with the strength, toughness and uniformity to withstand extreme and continued stresses. Available with all necessary sheet piling accessories. In Inland Copper-Alloy, at slight additional cost. And Inland sheet piling specialists with broad experience are available to help you on sheet piling problems. Write for Booklet SP2.

INLAND STEEL COMPANY
38 S. Dearborn Street, Chicago 3, Illinois

SERVICE HOURS

...*not Footage*

The True Yardstick of Air Hose Value

When buying air hose, your thinking should not be in terms of footage-per-dollar but rather in terms of service hours.

Experience tells you that the hose which is built with an *extra* measure of strength, flexibility, damage resistance and safety is surely your soundest investment.

This is true of *every* BWH Air Hose. Each has been specifically developed, tested and field-proven to give maximum long, trouble-free life in its job.

Get in touch with your BWH distributor — *today*.

BWH

DEPENDABLE RUGGEDNESS

BOSTON WOVEN HOSE & RUBBER COMPANY

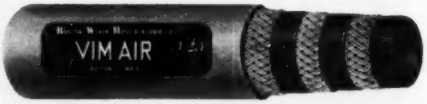
Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS.
P.O. BOX 1071, BOSTON 3, MASS., U.S.A.
Warehouse Stock, 111 N. Canal St., Chicago, Ill.

CONCORD AIR — An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforced carcass. Tough grey cover resists cutting, gouging, abrasion. 7 sizes from ½" 2-braid through 2" 3-braid. 200 to 300 lbs. working pressure. Maximum length 50'.

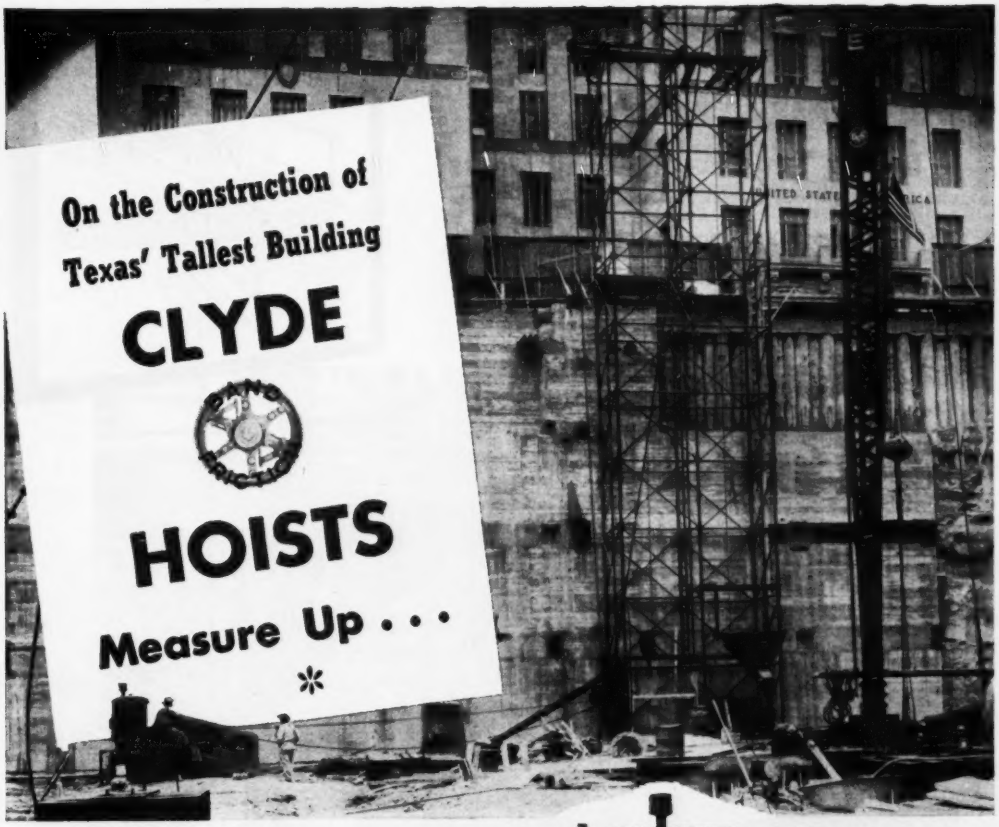
BAY STATE AIR DRILL — For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from ½" to 4". Working pressures from 150 to 225 lbs. Max. length 50'.

AUROCHS AIR — For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: ½", ¾", 1". 200 lbs. working pressure. Maximum length 50'.



VIM AIR — For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, ¼" 2-braid to 1" 3-braid. Working pressures: 150 to 225 lbs. Maximum length 500'.

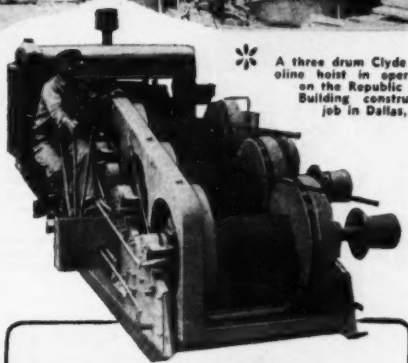
BULL DOG VARI-PURPOSE AIR — For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.



. . . from every angle!

Any way you look at it, the selection of a Clyde hoist for the construction of Texas' tallest building was "satisfaction assurance" for the contractor. Spotting *more loads* with *less fatigue* looms large in reducing the material handling cost of any construction project.

Clyde high-speed band friction hoists are the finest hoists ever offered the construction field. Smooth and easy acting band friction clutches . . . the ease with which adjustments can be made . . . replacement of linings without removing drums . . . powerful brakes that allow "toe control" of capacity loads . . . ball and roller bearings throughout . . . electrically welded all steel frame . . . these are but a few of the features that make Clyde Hoists worthy of your careful study.



A three drum Clyde gasoline hoist in operation on the Republic Bank Building construction job in Dallas, Tex.

Put A Clyde To Work On Your Next Job!

For high speed, smooth and easy operation, try a Clyde. Available with one, two or three drums with electric, gasoline or Diesel power. Four popular sizes with nominal line pulls of 8,000, 12,000, 16,000, or 21,000 lbs. and line speeds up to 400 f.p.m. Write today for circular MP-48 for complete specifications.

CLYDE

WHIRLEYS • DERRICKS • HOISTS •
HANDI-CRANES • ROLLERS
BUILDERS TOWERS • CAR PULLERS •

ESTABLISHED 1899

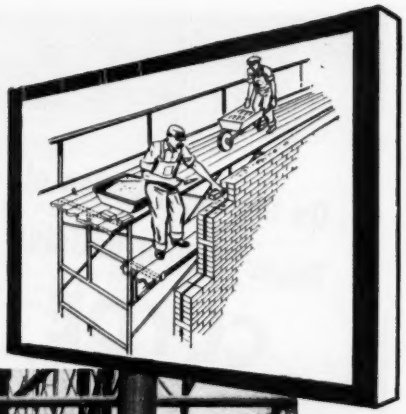
CLYDE IRON WORKS, Inc.

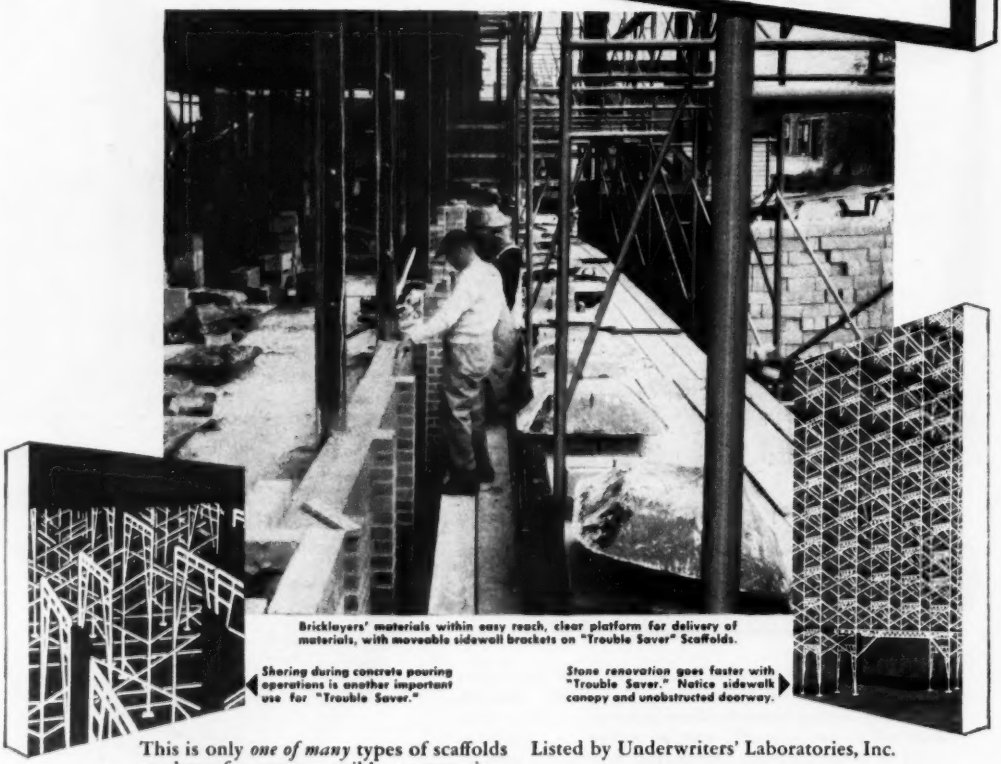
DULUTH MINNESOTA

SUBSIDIARY OF BARIUM STEEL CORP

PREFABRICATED
to Cut Your Scaffolding Costs!

"TROUBLE-SAVER"
Sectional Steel Scaffolding





Bricklayers' materials within easy reach, clear platform for delivery of materials, with moveable sidewall brackets on "Trouble Saver" Scaffolds.

Shoring during concrete pouring operations is another important use for "Trouble Saver."

Stone renovation goes faster with "Trouble Saver." Notice sidewalk canopy and unobstructed doorway.

This is only *one of many* types of scaffolds we have for every possible construction, renovation and repair job. No tools are required to assemble and disassemble. Fully *coped and welded* frames, and full *double diagonal* bracing give greatest safety and rigidity. Prefabricated "Trouble Saver" Scaffolding, which we distribute, can help you increase profits by substantial savings in time and labor.

Listed by Underwriters' Laboratories, Inc.

Remember this: We have *all* types of modern scaffolds. That's a convenience *no other supplier* can offer you. Our stocks of scaffolding, spotted in major cities from coast to coast, are the largest and most complete. *One* source for every type scaffold! *Whatever your job . . . we can scaffold it for you with the* RIGHT *scaffold.*

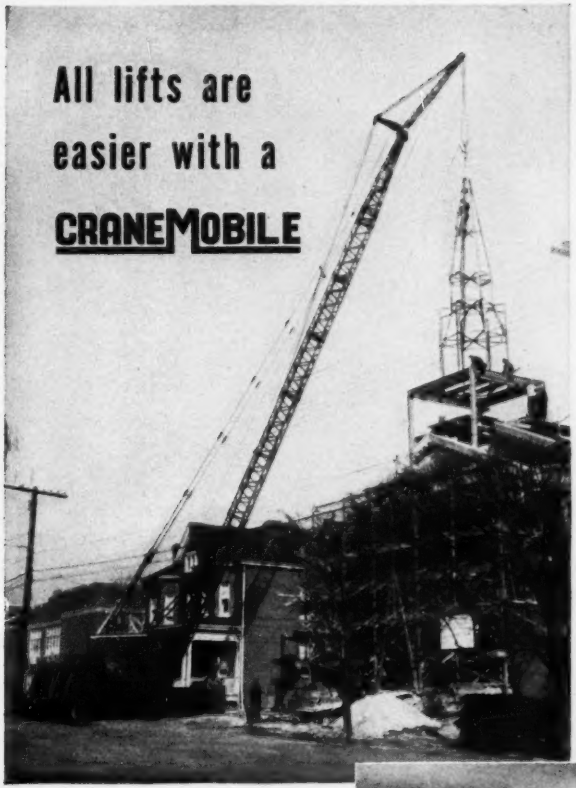
RENTALS—SALES
You can rent or buy "Trouble-Saver" Scaffolds, whichever best suits your needs.

for Greater Safety...Efficiency...Economy

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E, Long Island City 1, N. Y.
West Coast Plant: 6931 Stanford Ave., Los Angeles 1, Calif.

Get the facts! Write today for free Bulletin PSS-24. It shows how "Trouble Saver" can help you cut scaffolding costs. Photos of actual installations and detailed sketches are featured.



Do you . . .

— want to handle a 25 ton machinery base?

— want to set a church spire with 90 foot boom and 15 foot jib?

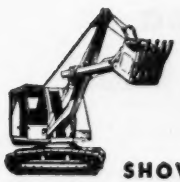
You may not meet these job conditions every day—but when you do, the CraneMobile with its greater flexibility, wider mobility and higher stability will handle the lift easier. The BAY CITY has earned a reputation for dependable performance in working long booms for high reach and short booms for heavy loads.

The CraneMobile offers many outstanding operating advantages—and is packed with refinements. A deep-section pin-connected boom for quick assembly . . . an independent worm boom hoist which raises or lowers only under power . . . a power load-lowering device for precision handling of heavy loads. Then there is the specially designed and BAY CITY built carrier which has a wide selection of road speeds up to 35 mph. The CraneMobile is made in several sizes with ratings from 10 to 25 tons. For the complete story, get in touch with your nearest BAY CITY dealer or write today for the CraneMobile catalog. BAY CITY SHOVELS, INC., BAY CITY, MICH.

CHECK THESE FEATURES

- √ Pin-Connected Boom
- √ Hi-Collapsible Gantry
- √ High Road Speeds
- √ Independent Power Boom Hoist
- √ Precision Power Load Lowering
- √ Removable Counterweight
- √ Specially Designed Carrier
- √ 20-25 Ton Capacity

206

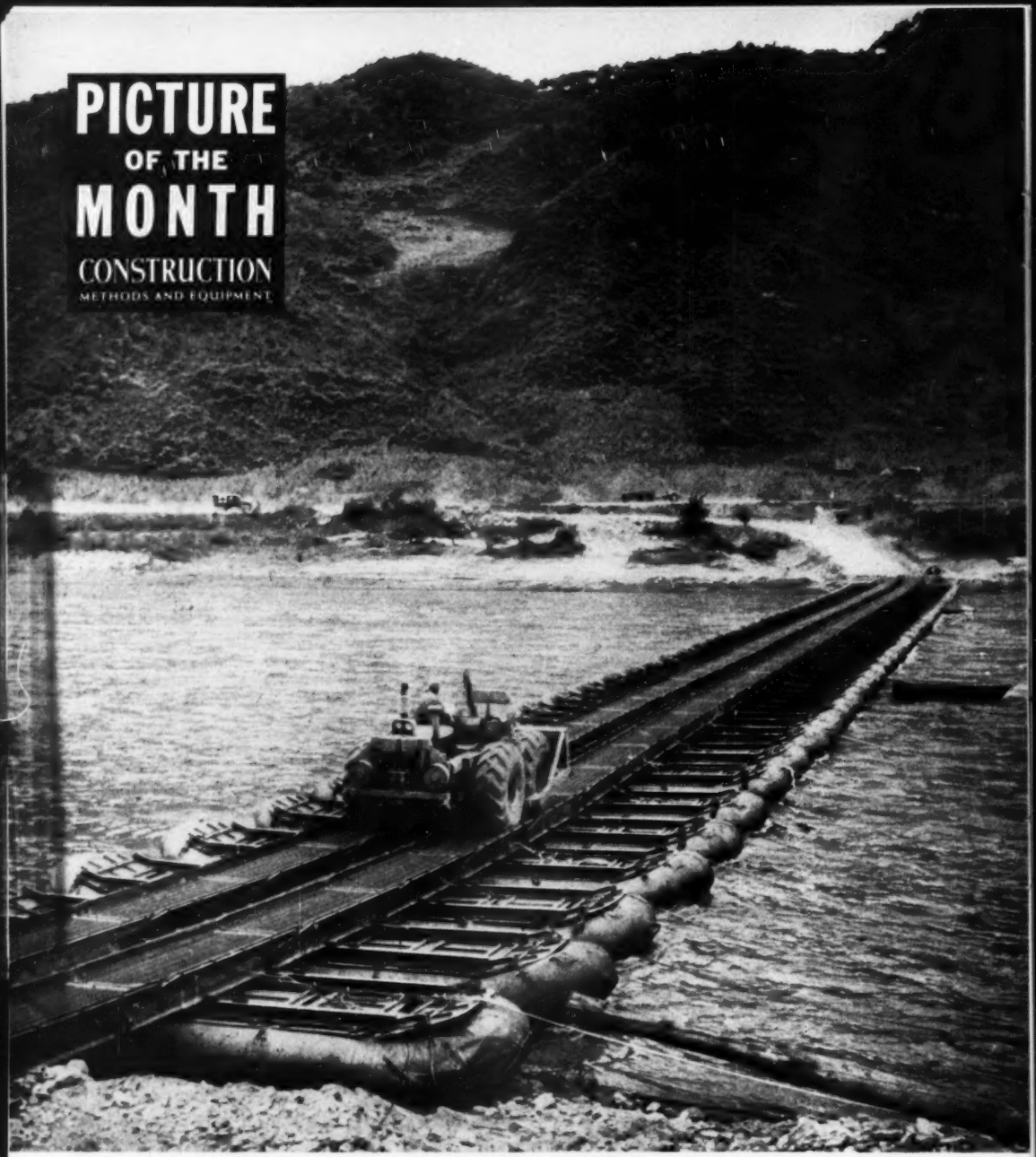


BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

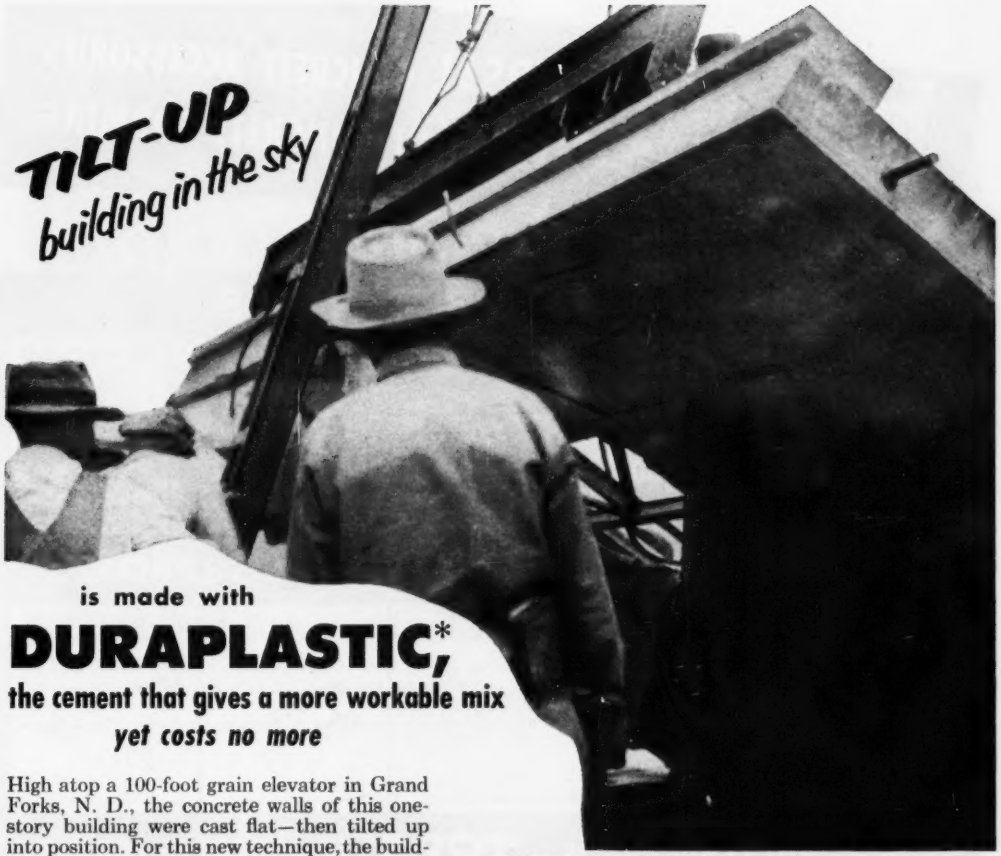
PICTURE OF THE MONTH

CONSTRUCTION METHODS AND EQUIPMENT



Moving Up Somewhere in Korea

LE TOURNEAU Tournadozer scoots across a pontoon bridge over a turbulent stream on its way toward a Korean battle area to serve the 74th Engineer Heavy Equipment Company. Combat engineers use more and more heavy construction equipment to widen and repair roads; rip new arteries through steep mountain terrain; construct access roads for signal installations; build air strips; and build up approaches to bridges — often working in frozen ground. The 74th Engineers have Tournadozers working all over the Korean battle areas — most of them right up to the front lines.



is made with

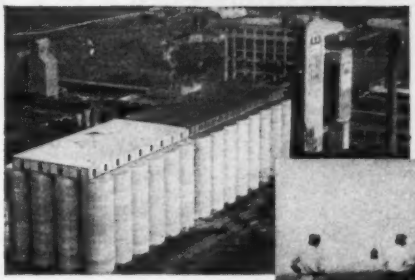
DURAPLASTIC,*

the cement that gives a more workable mix *yet costs no more*

High atop a 100-foot grain elevator in Grand Forks, N. D., the concrete walls of this one-story building were cast flat—then tilted up into position. For this new technique, the builders specified a *time-tested* material — Atlas Duraplastic air-entraining portland cement.

They already had proof of Duraplastic's performance—because the elevator below was also Duraplastic-made! The increased plasticity and cohesiveness of Duraplastic concrete, which aids proper placement and helps to improve surface appearance, resulted in this neat slip-form job.

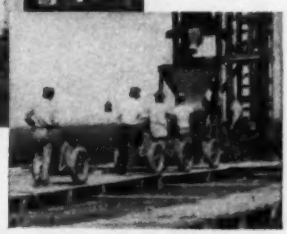
For more than a decade, Duraplastic has made better concrete for all types of structural jobs. Yet it sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



General Contractor: Northern Construction Co., Grand Forks, N. D.

Sub-Contractor: Hagenson Construction Co., Minneapolis, Minn.

DURABLE JOB—Water gain and segregation are minimized by Duraplastic's air-entrainment feature, and resulting concrete is fortified against the effects of freezing-thawing weather.



THE MIX SHOWS—There's an important difference when the mix is made with Duraplastic cement. Less mixing water is required for a given slump, yet the concrete is more plastic, more uniform and easy to place.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company

ATLAS DURAPLASTIC
AIR-ENTRAINING PORTLAND CEMENT

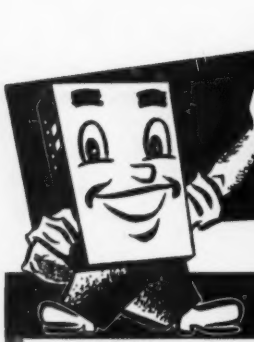
A UNIVERSAL ATLAS PRODUCT

CM-D-138

Makes Better Concrete at No Extra Cost

"THEATRE GUILD ON THE AIR"—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network

OFFICES:
Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.



UNIVERSAL CONCRETE ACCESSORIES "TOPS" IN CONCRETE FORMING

A COMPLETE LINE FROM 1 SOURCE

FORM TIES

SPIROLOC Form Ties Standard

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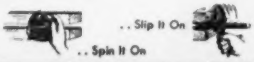

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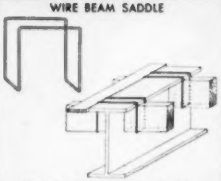

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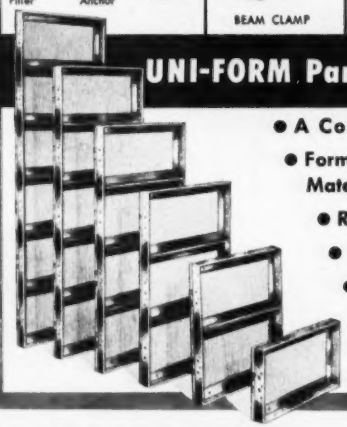

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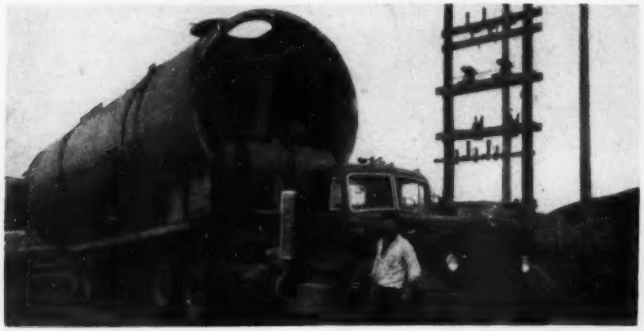
Construction News in Pictures . . .

FLOOD RACE— Big earthmoving equipment was brought into the battle last month to stave off flood waters brought on by the rampaging Missouri River. Here scrapers and tractors are plowing through mud to build up levees in a desperate race against the rising Big Muddy at Council Bluffs, Iowa. Heroic stop-gap measures were taken in many communities by big equipment and by hand labor, to gain valuable time against the torrent which finally was contained in its channel.—Wide World photo.

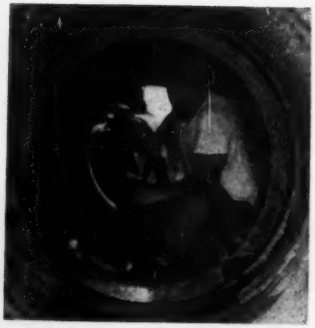
BIG LIFT— Pacific Crane & Rigging Co. erects a 157-ft, 200-ton distillation tower in Torrance, Calif., for General Petroleum Corp. Truck crane erected 100-ft riser pole to raise first steel pole — which then was used to erect other three. Two single-drum hoists did lifting. Bottom of tower rested on a timber truck moving along track on wooden rollers.

FLUNKED OUT— This veteran Model 71-C Bucyrus steam shovel helped excavate the Panama Canal in 1906. Its last owner was the France Slag Co., Donora, Pa., who acquired it in 1936. Since then, the 90-ton 2½-yarder has shoveled about one million tons of slag. It did all right until recently when its boiler failed to pass the State safety inspection.—Pittsburgh Press photo.

(Continued on next page)



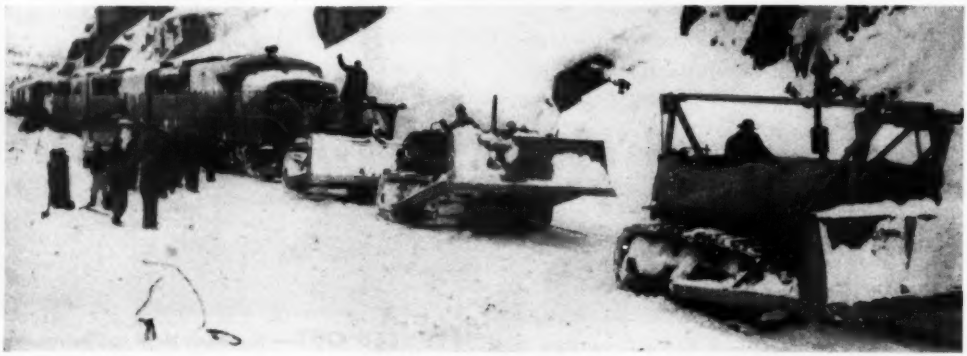
BIG LOAD — Winston Bros., Inc., hauled this 750-bbl Noble cement silo 10 mi over back roads through Colorado foothills from rail siding to site of Flatiron power and pump plant on Colorado-Big Thompson project. Driver S. R. Conkey proudly stands alongside his big Mack truck that pulled trailer with 45-ft, 17-ton load over the rough mountain roads without a sputter.



JOINT TESTER — Worker tests for leakage between 42-in. concrete pipe-sections. Method devised by Bureau of Reclamation engineers use ordinary tire pump to put air and water pressure on a joint.

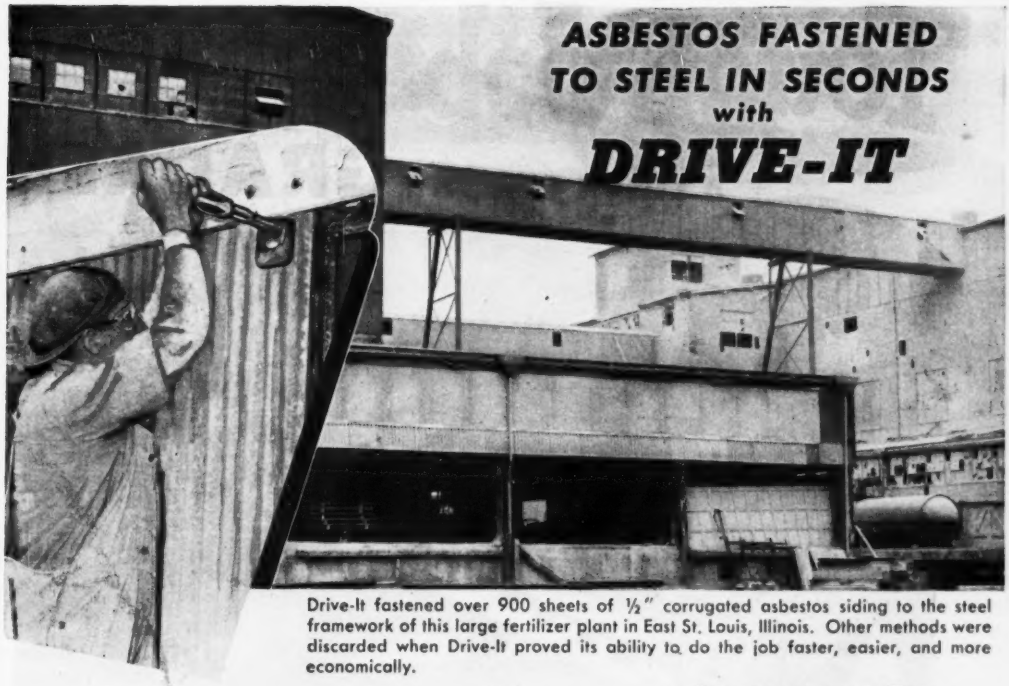
HOT BATH — Clean construction equipment works better, and cleaning before overhaul saves valuable time. Contractors can take a leaf from distributors who do this sort of thing all the time. Here a mechanic in the shops of Merrill-Brose Co., Oakland, Calif., distributor, uses a Maisbary heavy-duty cleaner on an International TD9 tractor and Bucyrus-Erie dozer-shovel. Machine supplies steam—and cold water under pressure.

BURRO TRANSPORT — Susie, the burro, is used by McClelland Supply Co., Phoenix, Ariz., to make deliveries to out-of-the-way locations. Here she carries 1,200 ft (124 lb) of Carlon plastic pipe.



GETTING IT MOVING — Three Caterpillar D8 diesels team up to free the locomotive of the "City of San Francisco," Southern Pacific streamliner that was snowed in for six days with its passengers at Yuba Gap in the Sierra Mountains. Bulldozer blades were used first to clear away deep snow, then locomotive and passenger cars were pulled free, one by one. Contractors who furnished three D8's and one D7 were A. Teichert & Sons, Inc., and Lentz Construction Co., both of San Francisco.

ASBESTOS FASTENED TO STEEL IN SECONDS with DRIVE-IT



Drive-It fastened over 900 sheets of ½" corrugated asbestos siding to the steel framework of this large fertilizer plant in East St. Louis, Illinois. Other methods were discarded when Drive-It proved its ability to do the job faster, easier, and more economically.

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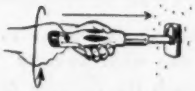
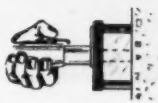
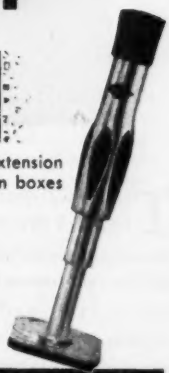


DRIVE-IT cannot be discharged accidentally due to the push and turn sequence. This, plus the large safety pad makes *DRIVE-IT* triple safe.



Exclusive Automatic Barrel Extension for fastenings inside junction boxes or other recesses.



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GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE *with Controlled Down Pressure*

Volume 34
Number 5

CONSTRUCTION
METHODS AND EQUIPMENT

MAY
1952

Harold W. Richardson, Editor

There Ought to Be a Law... Nuts!

THE MANIA of American business to rush to Congress and state legislatures seeking protective and restrictive laws has now permeated the construction field. Organized specialty contractors are yelling for national and state legislation to protect them in their dealings with those monsters—general contractors. In fact, they want laws stipulating direct contracts for subtrades, thus bypassing the general entirely.

Lord knows, construction already is handicapped by too many legal restrictions and regulations. For the good of the construction industry as a whole we can see no need for legislation to solve inter-industry problems that can and should be settled by better understanding, better industry relations and a little more adherence to sound business ethics.

By and large the generals are at fault in this squabble with the subs because of their pernicious practice of bid shopping. We heard one general contractor boast that he has never yet accepted a vendor's just quotation or a sub's first bid. Of course, he is kidding only himself—he never got a low price or a low bid in his life, for every figure he receives is padded to allow for future chiseling. We don't blame the subs for wanting to get out from under such obnoxious procedure. Yet, legislation and separate contracts are not the answer, considering the best interests of the industry and the client.

The subs themselves are not entirely blameless in this situation. They, too, frequently are guilty of bid peddling, a practice that adds nothing to mutual faith and trust between subs and generals. Furthermore, we suspect—and we are not alone in these suspicions—that the subs feel they might get better prices under a separate direct bid system than they do under subcontracting. After all, the generals know about what a sub job should be worth; we doubt if many architects do.

Half a dozen states have laws permitting or directing award of separate specialty trade contracts on public works. Plumbing, heating and electrical contractors are seeking similar legislation in other states and in Congress. They claim numerous advantages in such a system, none of which we can see. Furthermore, they assert that since the architect is paid by supervising construction, he should be made to assume the supervisory and coordinating responsibility.

Ah, there's the rub! Mighty few architects have the organization, experience or ability to coordinate and supervise large construction projects. That is the job for the general contractor, and only he can do it. Project direction and coordination must be under a single capable head if utmost efficiency and fullest value to the owner are to be achieved.

The battling subs claim the direct award system is working out well in states where it is permitted. Working out well for whom? Subcontractors or owners? We've seen some gosh-awful messes where the architects—good ones, at that—thought they could run the job better under separate contracts than could a general contractor. And the owner took the rap.

So far only the three big mechanical specialty contractors—plumbing, heating and electrical—are demanding separate contracts. What will keep the others from making their claims, too? How about the tile setters, glaziers, floor men, masons, acoustical and the host of other subs? Once started, separate contracts could easily get to the ridiculous stage. Each would go its own separate way into utter confusion and chaos.

Construction at best is a complex procedure. The general contract award system has brought to this country the most efficient and satisfactory method of prosecuting the complexities of construction into structures of greatest value to the owner. For the best interests of all, this system should not be changed.

But the relations between subs and generals certainly should be bettered and subcontracting abuses corrected. More laws, more restrictions, more regulations are not the desirable way out. No, the answer lies in better understanding and mutual respect and faith, one in the other. How about joint cooperative committees between specialty and general contractor associations to achieve such understanding and to work out sensible subcontracting relationships?

We are reminded of a chant learned from neighboring Sioux Indian pals as a kid in South Dakota that ended: ". . . so according to the signs of weather we bump their leather heads together." The weather is stormy, and oh for some power to bump their leather heads together to pound some sense and understanding into both subs and generals before this squabble wrecks a sound construction procedure.

Rich

LOADING THE AMMUNITION for flood battle at Council Bluffs. This sandbagging operation keeps 450 men busy around the clock. Bags are filled by hand with sand dug from bluff by variety of draglines. Filled bags are hoisted on to dump trucks by front-end loaders, such as the Hough rig mounted on an International TD-9 tractor in foreground. Then they are hauled to crews struggling to save North Levee in upper background. Omaha area contractors dropped everything to mobilize for this flood fight.

CONSTRUCTION EQUIPMENT LICKS

SECONDARY LEVEE is built in a hurry across Union Pacific RR yards in Omaha to back up one of weak spots in levee system protecting city's low-lying industrial district. Railroad did this job with own forces and hired equipment. International TD-9 tractor pulling sheepsfoot roller leads the equipment parade here.

AFTER DROWNING OUT the entire valley from Bismarck-Mandan, N. D., on down with its greatest flood on record, the Missouri River met its match at Omaha and Council Bluffs. Here the Big Muddy was licked by a formidable array of construction equipment, backed up by a group of determined contractors and 2,000 of their forces, plus some 18,000 troops and volunteer workers, all mobilized by the Missouri River Division and the Omaha District, U. S. Corps of Engineers.

As part of the Pick-Sloan plan for development and control of the Missouri River, a levee system was recently completed to protect Omaha and Council Bluffs against a river stage of 26.6 ft (flood stage is 19) with a 5-ft freeboard. These levees, a combination of concrete

ON OMAHA SIDE crew places sandbags to reinforce wooden flashboards built on top of concrete floodwall. Temporary levee across tracks below bridge was thrown up by dump trucks and bulldozers for additional protection to Omaha Public Power District generating station to right of railroad. In foreground, temporary levee similar to one in distance takes off from concrete wall to complete powerhouse enclosure. Temporary track and road cross over this near embankment.

BIG MUDDY AT OMAHA

Pictures and Information From International Harvester Co.
(Except as Noted)

walls and earth embankments, total 23 miles in length and confine the stream to a relatively narrow channel. Previous record flood stage was 24.6 in 1881, without the restricting levees. The 26.6 protection level for the new levees was considered adequate in view of the three big dams under construction upstream — Garrison, Oahe and Ft. Randall.

With a flood stage of 31.5 ft predicted for the current flood, which would just top the new levees, Brig. General Don G. Shingler, Division Engineer, and Col. Henry J. Hoeffer, Omaha District Engineer, after consultation with Lt. General Lewis A. Pick, Chief of Engineers, decided on April 11 to raise all levees 2 ft. They decided also to throw up secondary levees

RAISING THE LEVEE near airport in north Omaha calls for bulldozer and truck fleet. Here, Miller Excavating Co.'s International TD-18A tractor, equipped with Bucyrus-Erie cable dozer, spreads fill while a truck follows behind the tractor with another load. The crest came within 2 ft of top of this levee.

RAILROAD TRACKS are sacrificed in the battle to save Council Bluffs. Here an International TD-14A tractor equipped with a Bucyrus-Erie bulldozer rips up track and shoves ties out of way on main line of Chicago & Northwestern RR between Omaha and Chicago. Porous ballast and subgrade are removed to allow better base to be built under two secondary levees, one more than 8,000 ft long, 10 to 15 ft high. Ace and Parks outfits moved 100,000 yd into these fills in 96 hr.

SMART CHAPS, these Omaha contractors. Miller Excavating Co. charges transit mixers with sand, then as drums discharge, fills bags from spout at rate of one per minute.

DISTRIBUTORS aid flood fight by servicing equipment and keeping it rolling. Here Nebraska Tractor & Equipment Co. repair crew with field service truck works on big dragline down on Ace Construction Co.'s emergency levee job in north Council Bluffs. Only those on the job realize value of this kind of distributor cooperation.

as additional protection for some of the most critical areas. All this was accomplished in 5½ days, 24 hr ahead of the actual crest of 30.4 on April 18.

The Army Engineers called in several contractors in the Omaha area, who characteristically dropped all their own work to rush men and equipment into the flood fight. They gave no thought to contracts and terms—they could be negotiated later—there was work to be done right now. More men and equipment were supplied by the Army and other agencies.

A quick check on equipment in use showed the following: 210 crawler tractors and bulldozers, 350 motor scrapers, 74 sheepsfoot rollers, 73 graders, 38 draglines and shovels, 19 front-end loaders, plus floating rigs, welders, transit-mix trucks and some 5,000 trucks of all descriptions.

The levees were raised 2 ft and topped by wood flashboards and sandbags, requiring some 3½ million bags and 2½ million fbm of lumber. Fill was borrowed from every bluff within hauling distance. Hauls were as long as 2 mi on the Omaha side, but averaged much shorter across the river. All earthmoving equipment worked around the clock. Some outfits placed better than 1,000 yd per hr.

Major contractors on the job were:

North Omaha levee to airport—Peter Kiewit Sons' Co., Omaha

Airport to Omaha concrete wall —Miller Excavating Co., Omaha

Concrete wall to South Omaha bridge — Parsons & Metcalfe Construction Co., Condon - Dunningham, both of Omaha, and Abel Construction Co., Lincoln

HIGH LOESS BLUFFS provide ideal borrow material for the north Council Bluffs levees. On 1-mi haul the combined Ace and Parks outfits use 25 big rigs and 75 dump trucks to load, move, dump and spread more than 1,000 yd per hr. Major equipment units include 17 Tournapulls and one Caterpillar DM10 scraper, push-loaded by International TD-24 tractors; Cat D8 bulldozers; and Link-Belt and Bay City draglines. These operators and truck drivers worked 96 hr with total of only 6 or 7 hr sleep.

CONTRACTOR surveys the rising river. Ed Miller (left), president of Miller Excavating Co., Omaha, looks over the levee protecting the city's airport. In foreground, wooden mud boxes built as flash boards to top levee raising will be packed with earth.

ENCLOSURE LEVEE at south end of Omaha power plant is built up by Allis-Chalmers HD-10 bulldozer. Note sandbag ring around boil area in foreground to create hydraulic back pressure. This seep is also kept drained by big pump. (Allis-Chalmers photo)

North Council Bluffs levee, including two new shoestring levees —Ace Construction Co., Omaha, combined with Parks Construction Co., Omaha

Remaining Council Bluffs levees —Engineer troops

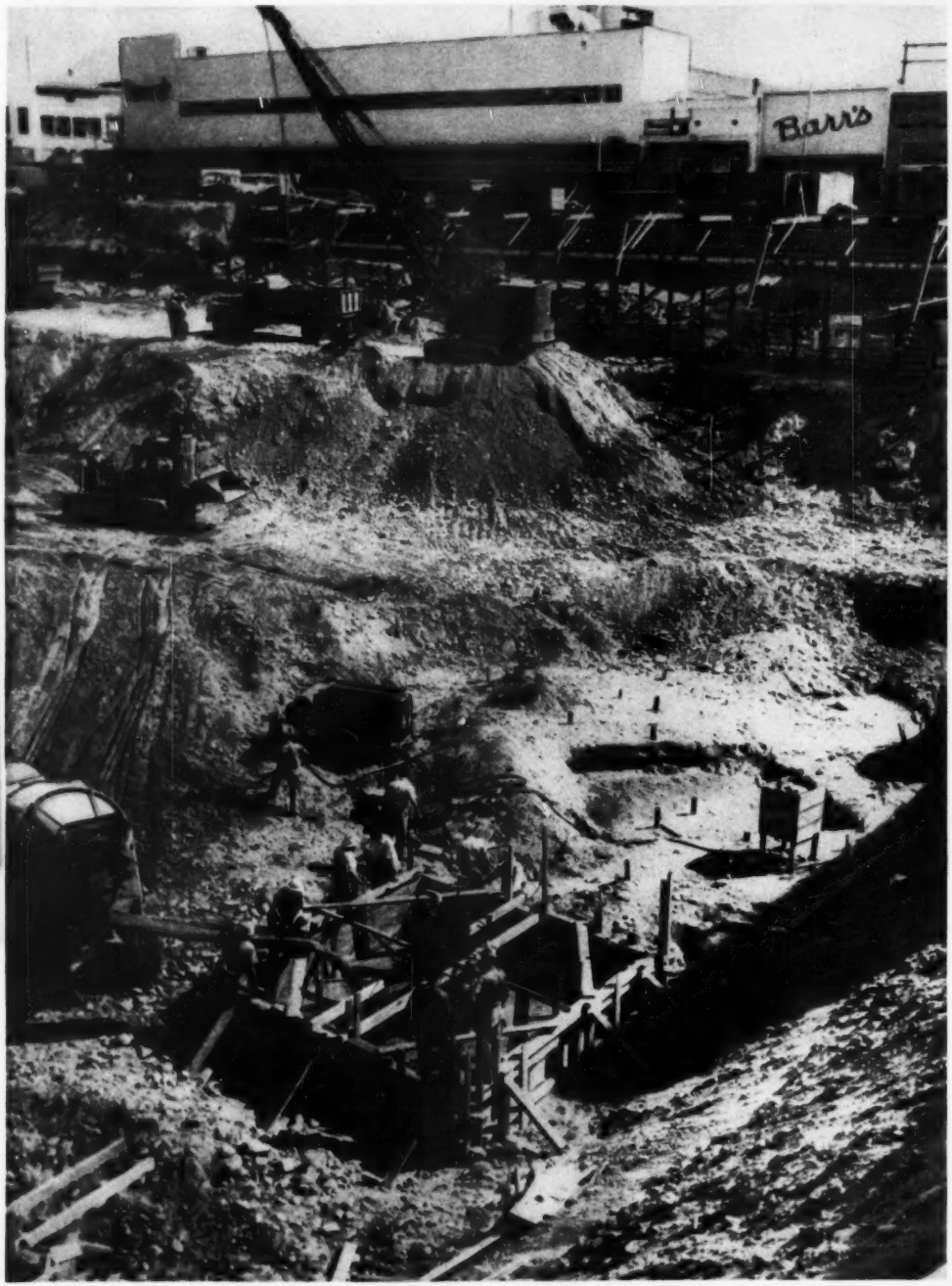
Material haul, both cities—Rorick Construction Co. and Orsman Construction Co., Omaha

Sandbag loading — E. A. Wickham Co., Council Bluffs

The accompanying pictures tell the story of how the flood fight was won. Congratulations to all for a job well done.

AIRPORT RUNWAY makes a good place to load sandbags. Sack filling started by hand, is speeded up by use of transit mixers. Drums are loaded with sand, then discharged through spout into sacks resting on pavement, eliminating a lot of tedious hand labor.

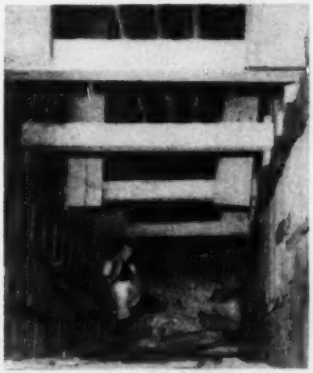
Sand and Gravel Make Excavation Difficult ...



FOOTINGS ARE POURED in one corner of three-story excavation long before all sand and gravel have been hauled out. Poured substructures were used later to help brace loose earth walls for side excavation. Piles on far side supported unstable bank.

... But Help Pay the Bill

PILE DRIVER sank 209 33-ft steel piles to support timber lagging and form a retaining wall to hold back sandy walls while excavation proceeded. Outside walls will be constructed last and the piles pulled out, as underground parking garage takes form.



COMPLETED SHAFT for theater pier support. After footings and reinforced concrete columns are poured, shaft is backfilled with lean concrete.

EXCAVATING THREE-STORIES DEEP for an underground parking garage; building "footstools" for an adjacent movie theater; and combatting the sand and gravel of an old riverbed all added up to a sizable chore for the Del E. Webb Construction Co. recently in the building of a $3,000,000 garage and department store at Phoenix, Ariz.

But the hole in the ground, occupying half of a city block, paid dividends for the Webb firm.

Sand and gravel from the excavation is of such top quality Webb sold the aggregate to a local sand and gravel firm. The purchase price made it possible for Webb to excavate at almost no expense. And part of the excavation is coming back in the form of concrete from the same company.

Officials joke about one day's operations when shovels grunted, trucks scurried in and out of the big hole—and the whole final net cost of the day's operation was a mere 30c.

The garage, being constructed for Landrum-Mills Realty Co., and the department store for the J. C. Penney Co., require an excavation sunk far below the level of the adjacent theater building. The sand and gravel extend downward for hundreds of feet.

Twelve concrete piers, reinforced and poured underground, have been installed to extend the theater's footings 25 ft below the level of the present foundation plates which are 15 ft below street level. This was a tedious job because great care was required in sinking the shafts.

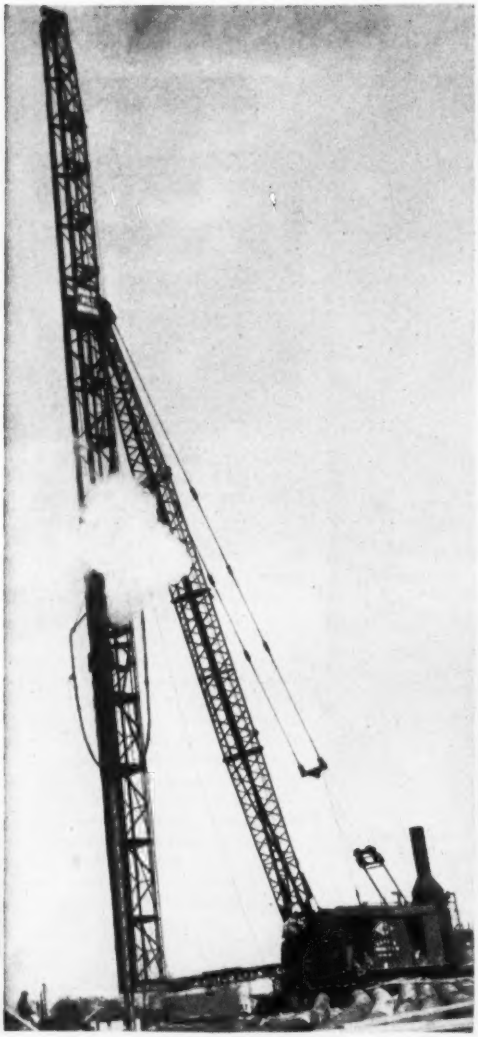
Biggest battle of the excavation is to hold back the sand and gravel side banks. Pile drivers hammered down 209 steel piles, each 33 ft long. Wood lagging was installed between the piles to hold back the loose ground.

Engineers decided against excavating the entire building site before starting construction. The Webb company drove down to the maximum depth at one spot, poured concrete footings and started construction of the underground area to spread from this point.

As the frame was erected, it was used to support more shoring to hold back the sandy walls while further excavation was carried on.

Outside walls will be poured last under this method, the piling pulled and the area next to the foundation walls backfilled.

FOUNDATION PLATE of adjacent theater extends over hole being excavated for deep concrete pier to extend theater's footings.



TOWERING PILE RIG drives shell for 133-ft Cobi cast-in-place concrete pile for East Hartford sewage treatment plant foundation in Connecticut. Leads on the the big Lima crane are 130 ft high.

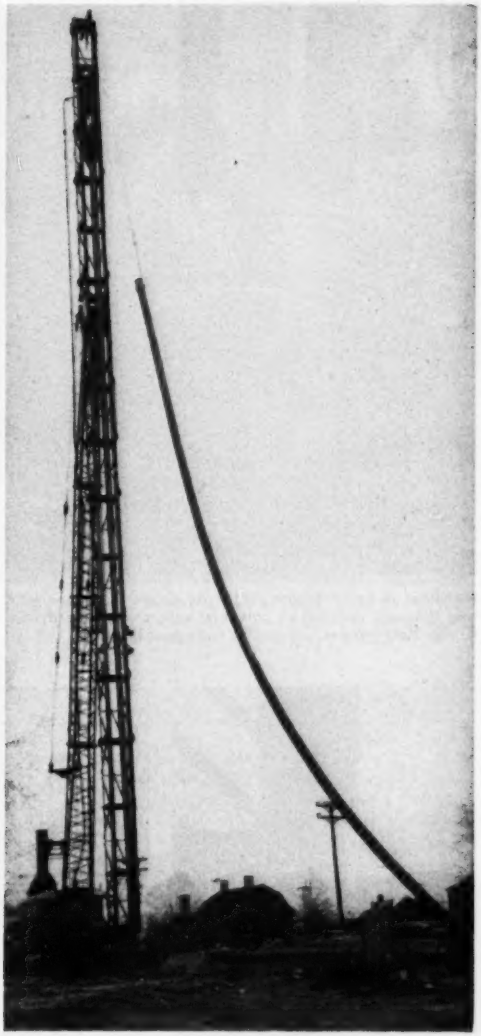
COBI MANDREL, collapsed by releasing compressed air that expanded it to grip shell throughout its length during driving, is removed from pile. This mandrel is 105 ft long, weighs 8 tons.

Air-Expanded Mandrel Drives Longest Thin-Shell Piles

CAST-IN-PLACE 12-in. concrete piles 133 ft long are no common item. Make their shells from a 103-ft length of uniform-diameter 16-gage corrugated metal, plus a 30-ft length of heavier pipe at the tip, and they become probably the longest thin-wall units ever driven. Drive them while the lightweight shell is gripped throughout its length by a 105-ft steel and rubber mandrel expanded by compressed air, and the job becomes even more

SHELL SECTIONS are spliced by gas welding to make up 103-ft length for driving. The 16-gage Hel-Cor shells, 12¼ in. in diameter, rest on wood rollers that turn for all-downhand welding.

TRANSITION SLEEVE to join light shell to heavier 30-ft pipe tip is arc welded to former in pile yard. (That sleeve just sitting on shell in foreground is upside down from its driving position.)



LONG, LIMBER SHELL is hoisted by piledriver to be lowered into 16-in. cased hole 100 ft. deep so mandrel can be inserted inside it. One such "doodle hole" serves for assembly for all piles.

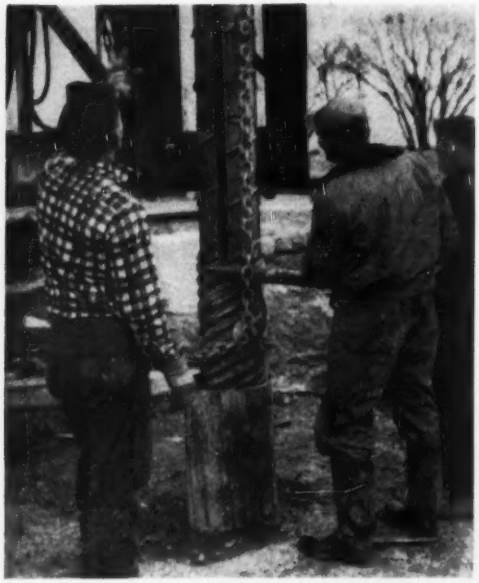
unusual—and unusually successful.

That's just what C. L. Guild Construction Co. is doing on its $97,000 contract for 155 of the long piles for two digestion tanks at an East Hartford (Conn.) sewage treatment plant. The 133-ft shells penetrate 25 to 30 ft of earth fill, 95 to 100 ft of wet sand and silt, and fetch up in a level layer of hard gravel. Driving progress averages 1 pile per hr.

Key to the job is an air-expanded mandrel developed by Walter Cobi, partner in the Pneumatic Pile Co. of New York. The Cobi mandrel (see sketch, next page) is of constant cross-section and weighs about 160 lb per lin ft. It consists of four sector-shaped pieces, each made up of longitudinal structural angles with an arc-shaped plate forming a quarter circle between angle toes. Helical half-round bars are welded to the arc plates every 18 in. to fit pile-shell corrugations when the mandrel is expanded.

The expansion medium is a circular rubber tube running the length of the mandrel as a core. It is contained within a square-section tube whose corners fit between adjacent sectors of the mandrel. This last tube is of rubber reinforced with nylon fabric that permits it to change shape but not expand.

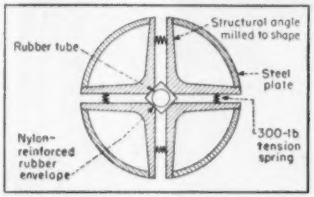
When blown up by compressed



MANDREL IS INSERTED into shell in the doodle hole. Chain from hoist line holds shell just off bottom of hole, peavy keeps it from turning. Note mandrel bars that fit shell corrugations.

ASSEMBLY IS RAISED from doodle hole after Cobi mandrel is expanded by 125-psi air from compressor in piledriver. Next step is to sit this 103-ft shell atop a previously driven 30-ft tip.

SECTIONS ARE JOINED by welding the transition sleeve to the driven tip. Tip is a 30-ft length of 10¾-in. closed-end pipe.



MANDREL IS SHOWN (schematically only, and not to scale) by this cross-section. Expansion is by compressed air introduced into circular rubber-tube core.

air (at 125 psi) the inner tube forces the surrounding envelope to assume a circular form, thereby increasing the distance between opposite walls. This, in turn, expands the mandrel by forcing its steel sectors outward so they grip the shell tightly all along the line. Maximum possible expansion is 1½ in.

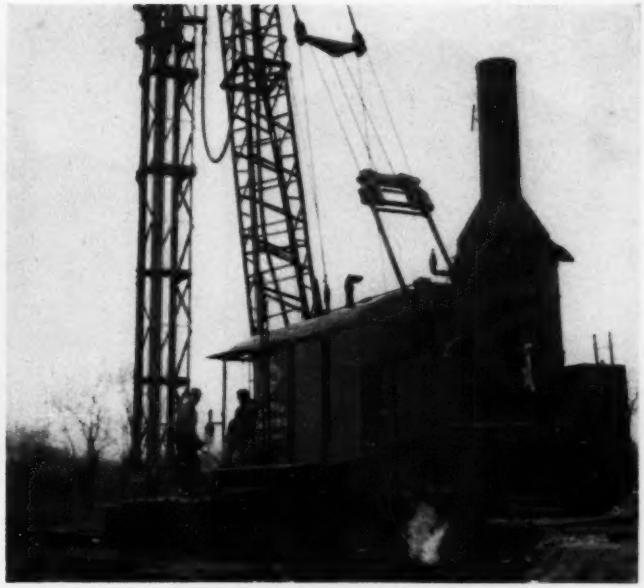
The mandrel is collapsed by releasing the air in the core tube. Collapse is aided by 300-lb tension coil springs at 15-ft intervals between adjacent sectors. In its collapsed state, the mandrel is ¾ in. smaller in diameter than the shell it drives.

On the East Hartford job, the 8-ton, 105-ft Cobi mandrel actually is made up of two shorter mandrels (45 and 60 ft) coupled together. It handles 12¼-in. 16-gage Armco Hel-Cor shells 103 ft long. Unlike standard Hel-Cors, the seams of these spirally corrugated units are not only locked by bending but, during manufacture, are fusion welded continuously through all four layers of the fold. This gives them extra strength and complete water-tightness.

Because unequal ground pressures at the extreme depth to which the piles are driven might collapse an empty 16-gage shell (the heaviest now rolled), the bottom 30 ft of the 133-ft pile is made up of 10 ¾-in. Armco spiral-welded pipe with a ¼-in wall thickness. Its foot is closed by a welded ¾-in. plate.

A cast steel transition sleeve joins the 30-ft tip to the 103-ft Hel-Cor shell. The upper section of sleeve is corrugated to fit the shell, to which it is welded; the inner surface of the lower section is milled for a driving fit over the pipe. An inner circular lip between sections acts as a shelf on which the bottom of the mandrel rests during driving. However, hammer impact is also transmitted to the shell, throughout its length, by the expanded mandrel.

Piles are driven by a Vulcan No. 1 hammer in 130-ft leads on a Lima



133-FT PILES ARE DRIVEN at rate of 1 per hr. Oil-fired boiler mounted on rear of Lima 802 piledriver crane supplies steam to the Vulcan No. 1 hammer, while compressor that operates crane's controls furnishes air to expand the mandrel. Part way up the 130-ft leads (left photo) are two sets of arms that can be swung closed to help support and guide the long pile during driving.

802 crane. The rig is powered by a 125-hp Waukesha gasoline engine fitted with water-cooled exhaust and water-head intake, which prevents icing of the carburetor and subsequent engine missing in cold weather.

Cantilevered from the stern of the crane is a 50-hp Dillon boiler fired by Aeroil burners to supply steam to the hammer. Within the cab is an oversize (40-cfm) compressor that not only powers the machine's pneumatic controls, but also supplies 125-psi air for expanding the pile mandrel and for starting the boiler's burner before switching to steam injection.

The long piles are put down rapidly, with the 30-ft pipe tip being driven almost to ground level before the corrugated shell section is attached. Usual procedure is to spot and drive 10 to 20 pipes, then hook the mandrel to the hammer and drive the corresponding shells.

Because they are so long, pile shell and mandrel must be assembled together in a "doodle hole" —a 16-in. casing driven 100 ft into the ground. It is located near the center of the foundation pattern so it can be used, with only short moves of the rig, for all 155 piles on the job.

After the piledriving machine lowers the shell into the doodle hole, it inserts the mandrel and expands it. Then the assembly is hoisted into the leads and placed atop one of the previously driven pipes. The shell's transition sleeve is welded to the pipe to insure watertightness, and the pile is driven. When the pile reaches required bearing in the gravel layer some 125 ft below, the mandrel is collapsed and removed. Later, after inspection, the driven piles are filled with concrete.

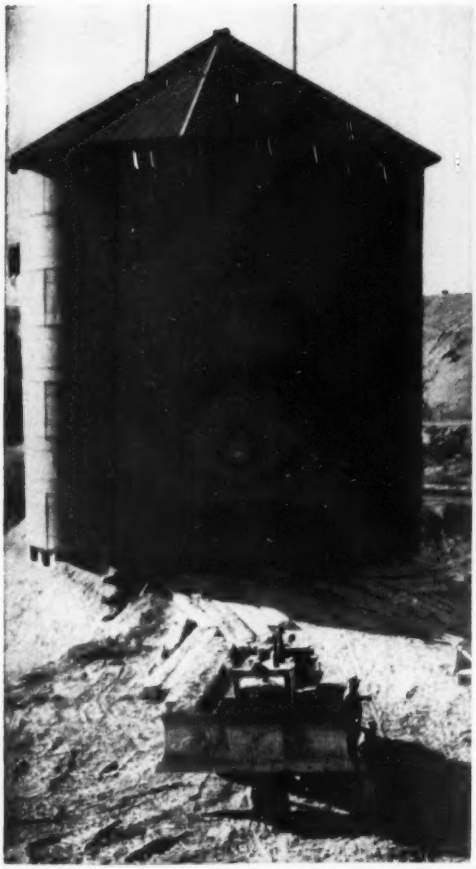
Design load on the long piles is 40 tons. Those tested under 60 tons, obtained by jacking up the piledriver on them, showed only 3/16-in. net settlement.

The East Hartford sewage treatment plant is being built for the Metropolitan District. The district's assistant design engineer, Earl Howard, is supervising the work. Boston's Metcalf & Eddy are consultants. The contractor driving the Cobi piles is the C. L. Guild Construction Co., Inc., East Providence, R. I.

Don't Over-Shoe Your Tractor

IF THE SHOE FITS, wear it—on your crawler tractor, that is. But if shoes are so wide that tracks don't slip under overloads, the gears take a beating. On turns, a too-wide shoe increases twisting stress against pins and bushings, builds up greater leverage loads on roller flanges, and reduces tractor power. On rough or rocky ground, a very wide shoe may span between humps and be bent by the load of the moving tractor. Shoes sometimes are so wide that the grousers don't sink to their full depth, decreasing effective grouser area and thereby increasing rolling resistance and track wear.

All these factors cut down track life and the tractor's maneuverability and speed. So adapt the track shoe size to the job conditions. Of course, there are many applications where wide shoes are necessary or desirable—where you need extra flotation. But most jobs are better done with recomended-width track shoes. That way you'll get maximum power, minimum down time, longer track life, better maneuverability and faster time cycles.

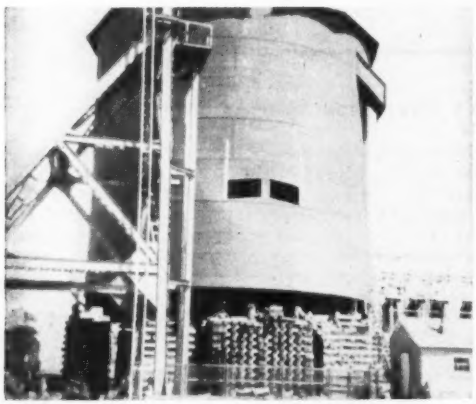


BULKY ORE BIN rolls along Ruth Highway on part of 2-mi trip to new location in Nevada. Earth fill protects pavement and levels up superelevation, while traffic takes detour to left of photo.

WASTE BIN and larger ore bin sit on 15-ft columns and straddle railroad tracks. This view shows them before moving. Ore bin is lined with 60-lb rail, which helps account for its 500-ton weight.

500-Ton Ore Bin Takes Two-Mile Trip Over Tough Terrain

By ROBERT K. YOUNG
Project Engineer, Foley Brothers, Inc.

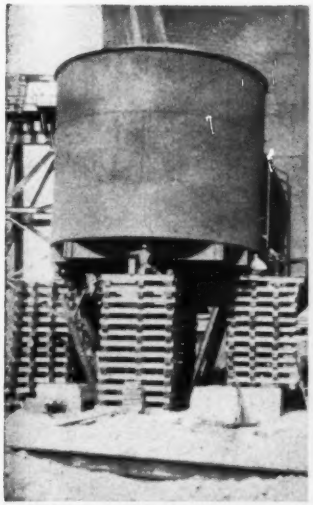


2,400 RAILROAD TIES form cribbing to hold 54x67-ft ore bin when its 48 supporting columns are cut loose. Next step will be to lower it 12 ft with jacks so it can be rolled to new site.

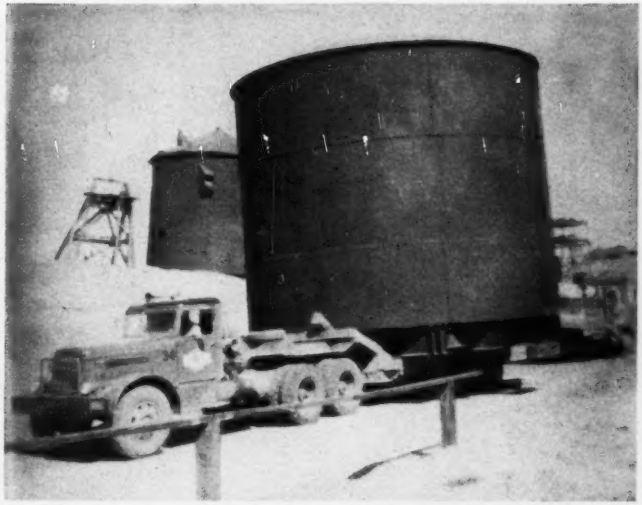
AN OUTSIZE ORE BIN—54x67 ft and weighing 500 tons—now sits at the Deep Ruth Shaft of Kennecott Copper Corp. near Ruth, Nev. Originally it was located at the corporation's Monitor Shaft 2 mi away.

Moving the big heavy structure required carving a haul road through waste dumps, rolling the bulky bin on grades up to 9%, and taking it through two 90-deg changes in direction. In addition, it had to be moved 12 ft vertically at both the beginning and end of the trip. The tricky moving assignment was handled by Foley Brothers, Inc., contractors from Pleasantville, N. Y., who are doing extensive surface and underground work necessary to put the Deep Ruth Mine into production.

The bin, 54 ft in diameter and 67 ft high above its supporting columns, stores copper ore as it comes out of the mine shaft. Two railroad tracks under it permit unloading into cars. The bin rests on four rows of columns: two 10-column exterior rows and two 14-column rows between the railroad tracks. The columns are15 ft 4 in. high above the concrete foundations and tie into 14 28-in. I-beams that support the bin floor. The bin's extraordinary weight—500 tons



JACKS on top of four timber cribs raise the waste bin so columns can be dropped out, then lower it for loading on to a trailer.



LOW-BED TRAILER, tailed by a bulldozer for safety, carries the waste bin from Monitor Shaft to Deep Ruth Shaft of Kennecott Copper Corp. Moving this 23x26-ft, 50-ton structure was one of the less difficult tasks of Foley Brothers on mine development work.

—is due partly to an interior lining of 60-lb railroad rail running vertically and having a horizontal spacing of about 6 in.

Before moving the ore bin and a smaller waste bin alongside, it was necessary to remove all chutes, gates, stairways and miscellaneous other steel that extended below the I-beams. Timber cribbings were then built up under the bins for the lowering operations.

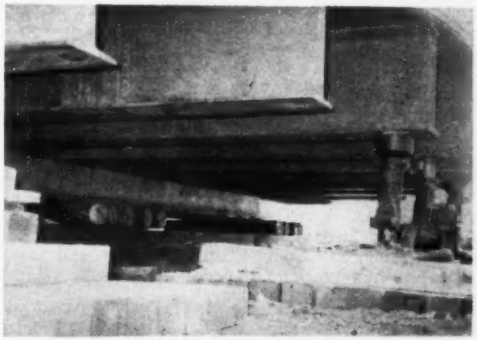
The waste bin—26 ft in diameter, 23 ft high above columns, and weighing approximately 50 tons—was moved first. It was simply jacked down on to a low-bed trailer-truck that hauled it to its new site. A Caterpillar D8 tractor was hooked on behind the trailer as a precautionary measure during moving because of the steep grades encountered.

Moving the outsize ore bin was another matter. Six solid cribs of railroad ties (2,400, in all) were built under this one; two along the outside of each exterior column line, and one at each end of the interior column lines.

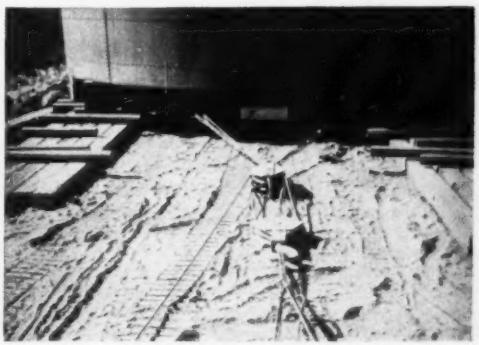
Twelve 100-ton jacks, both hydraulic and mechanical, were placed under the I-beams, and the bin was raised until the bottom of the columns cleared the anchor bolts. The columns were then cut loose from the I-beams and removed in pairs. The bin was lowered 12 ft into position for the first move. Great care was necessary during lowering to coordinate the men operating the jacks, in order to prevent overloading due to unequal weight distribution. Blocking was kept within 2 in. of the beams at all times.

While six jacks would have been sufficient, twice the required number were used to permit lowering from jack to jack, thereby doing away with the necessity of lowering on to blocking and then having to reset the same jacks. Ten working days were required for the lowering operation.

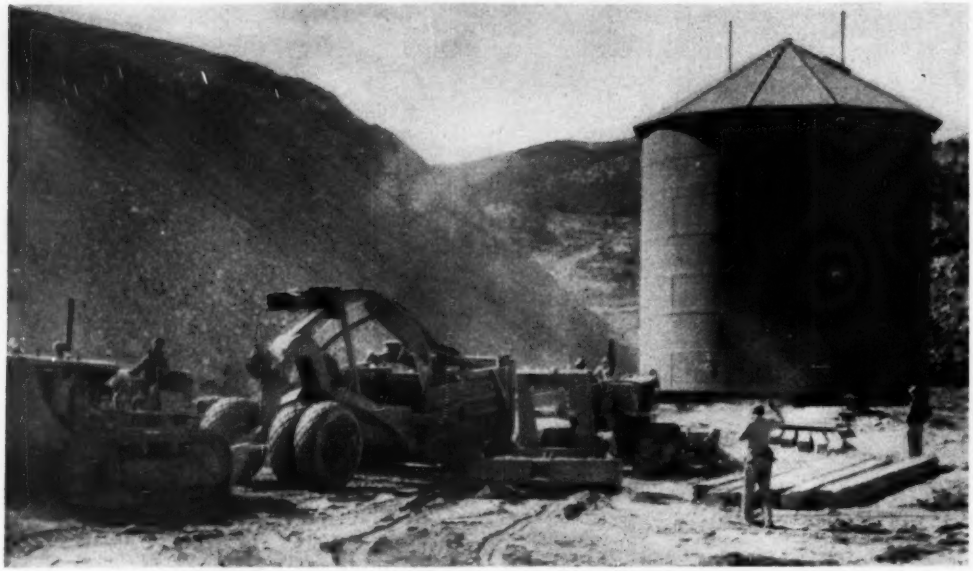
In preparation for the actual moving operation, 57 30-ft lengths of 12x16-in. timber were obtained for building tracks ahead of the bin. These were later supplemented with about an equal footage of 12x12



HEAVY TIMBERS sandwich the concrete-filled pipe rollers so ore bin can be moved at right angles to direction of its floor beams. Some of the 12 100-ton jacks that lowered the bin are at right.



SIX-PART TACKLE pulls bin along on 8-in. rollers that ride on tracks of 12x16-in. timbers. Because this move is 90 deg to that shown above, there are no timbers between rollers and bin.



MOVING EQUIPMENT includes two tractors pulling (one is hooked to the scraper, one is almost hidden behind the ripper), another tractor with its dozer blade and ripper dug in to act as a deadman, and two tractors pushing behind bin. Working with these machines was a winch truck fitted with a boom for shifting the timber tracks and rollers ahead as the long move progressed.

timbers when the original members raveled excessively.

Also, 100 rollers varying in length from 7 to 10 ft were made by filling 8-in. well-casing with concrete. This pipe had a ⅜-in. wall thickness. A circle of ½-in. plate was welded to each end to prevent concrete from crushing out, while half-hoops of rod were welded to each end to facilitate handling.

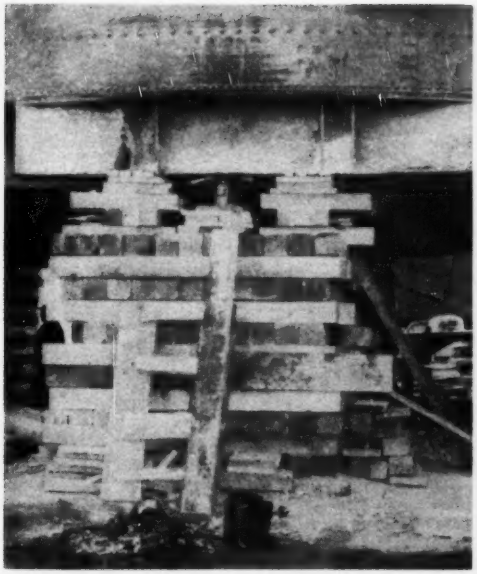
Moving was accomplished in the following manner. Two tracks, each consisting of four 12x16 timbers laid side by side, were constructed ahead of the bin. The rollers were laid out on these tracks and were fed in between the timbers and the bin-bottom I-beams as the structure was pulled ahead. When timbers and rollers were released behind the bin, they were brought up ahead for re-laying with a 6x6 winch truck.

For the first move of about 100 ft, it was necessary to place timbers between the rollers and the I-beams, since travel was perpendicular to the direction of the I-beams. After this first move, the bin was jacked clear, the top layer of timbers was removed, the bottom timbers were turned parallel to the I-beams, and the bin was lowered directly on to the rollers for the major portion of the trip.

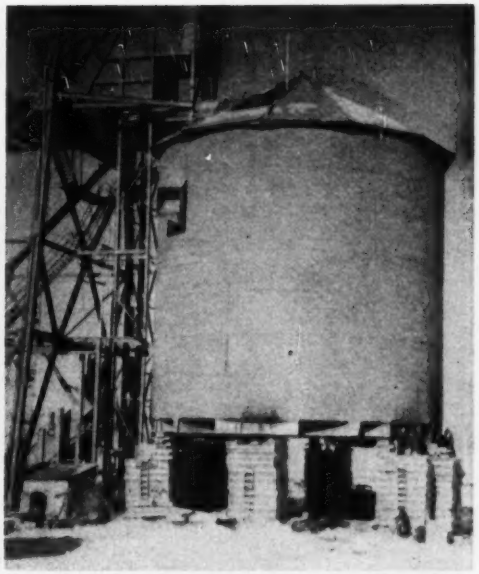
When moving the bin on level ground, a four-part line of 1¼-in. cable to a D8 tractor, with another D8 dug in as a tail-hold, was sufficient. For grades up to 2%, a six-part line was used. Grades up to 9% were encountered. This required a D8 dug in with a ripper behind for a deadman, two D8s pushing at the rear of the bin and two more pulling on a six-part line. The tractors behind the bin were primarily to prevent rolling backwards in case a cable broke. Curves were negotiated by angling of the rollers as they were fed in under the bin and by proper placing of the deadman and tractors.

The roughness of the terrain made a great deal of difficult road-

STEEP GRADES, which run up to 9%, are negotiated carefully. Other complicating factors during trip were necessity for crossing the tracks of Nevada Northern Railroad between trains, building 1 mi of 60-ft road, and making one 70x100-ft cut 40 ft deep.



MORE CRIBBING supports the bin as it is jacked up for insertion of supporting columns on completion of trip to new location. Note that blocking is kept close up under the beams for safety.



CLOSE CLEARANCE (only 7 in.) with headframe's vertical columns makes bin jacking a ticklish job at new Deep Ruth Shaft. Bitter winter weather and high winds don't help this operation either.

building necessary, and two D8 dozers were kept busy cutting trail ahead of the bin between moves. About 1 mi of road 60 ft wide had to be carved out of the sides of waste dumps. A cut 40 ft deep, 70 ft wide, and 100 ft long was made through a neck of land leading to one of the dumps. It originally was planned to move the bin around this dump on a relatively flat 3½-mi haul. When it was found that the bin could be handled on steep grades, the new route was selected in order to speed the job.

To bring the bin in over its new foundation at the Ruth shaft site, it was necessary to repeat the turning and moving operations (perpendicular to the supporting beams) that were made in moving out from the old location. Great care was taken in pulling the bin in over the foundation to see that it was exactly in position. This was made more difficult due to the closeness of the bin to the headframe and shaft. The sinking of the shaft, which was under way, could not be interfered with even though the ore bin had to be located 7 in. from one headframe column and 4 ft 5 in. from the shaft collar opening.

Cribs similar to those put beneath the bin during the original lowering were built under it as it was jacked up for insertion of supporting columns. The structure was raised into position in 15 working days. Four plumb bobs were suspended from the centerline of the supporting beams and were kept in place over the anchor bolts during jacking. Rocking from side to side during the lift had to be kept to a minimum due to the closeness to the headframe column. The care taken during the placing and jacking of the bin paid off, however, when the supporting columns slipped into place with ease.

Four and one-half months were required for the lowering, moving and raising operations. And the latter part of the move, as well as the raising of the bin, was slowed down by bad weather — extreme cold, heavy snow and strong winds.

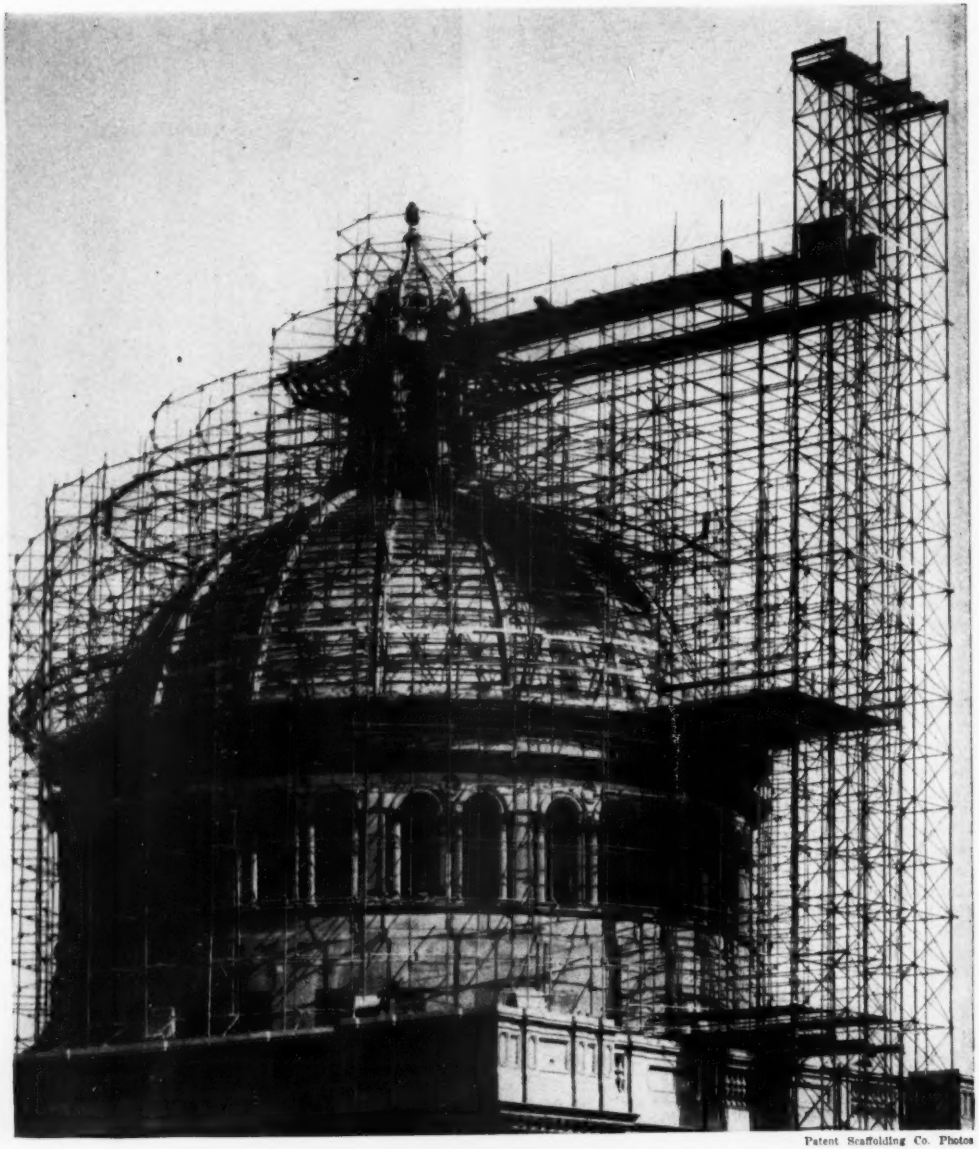
L. J. Bares is project manager for Foley Brothers, Inc. Bent H. Greve is structural steel superintendent and was in charge of moving the ore bin, as well as of the dismantling and re-erection of a hoist house and headframe.

John C. Kinnear, Jr. and Paul Hett are, respectively, general manager and assistant general manager of the Nevada Mines Division of the Kennecott Copper Corp. Sim W. Smith is the general superintendent of mines at Ruth, Nev. Alan A. Bakewell, Jr. is the project engineer for Kennecott.

Would Safety Have Paid?

BECAUSE WORKMEN were careless in placing steel protective mats for a blast, fly rock hit a worker 300 ft away. Compensation and medical aid for his lacerated face and injured eye cost the contractor $1,250. However, that was only the beginning. The rocks sprayed the job repair shop, rupturing some gasoline tank fittings. The shop burned to the ground, three pieces of heavy equipment were damaged by the fire, lumber stored alongside went up in flames. Total cost of this hot fiasco? A cool $28,250—right out of the contractor's pocket.

This tragicomedy is reported by the Constructors Association of Western Pennsylvania. It's another instance where a small safety lapse cost some big money.

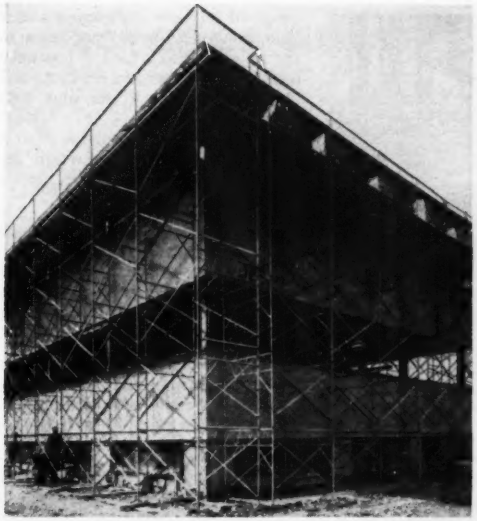


Patent Scaffolding Co. Photos

STEEL SCAFFOLDING

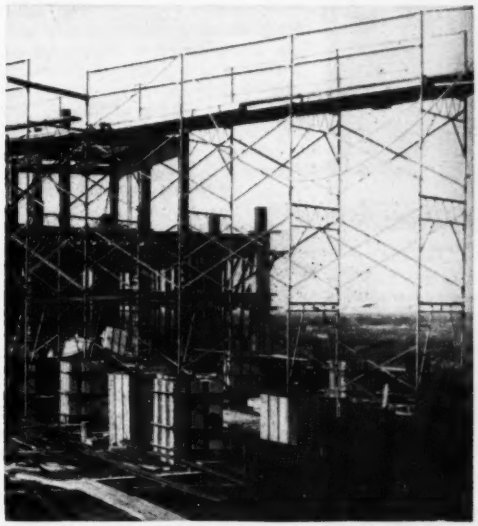
How to use it profitably and safely

By ARTHUR C. BORGMAN, Chief Engineer, The Patent Scaffolding Co., Inc.

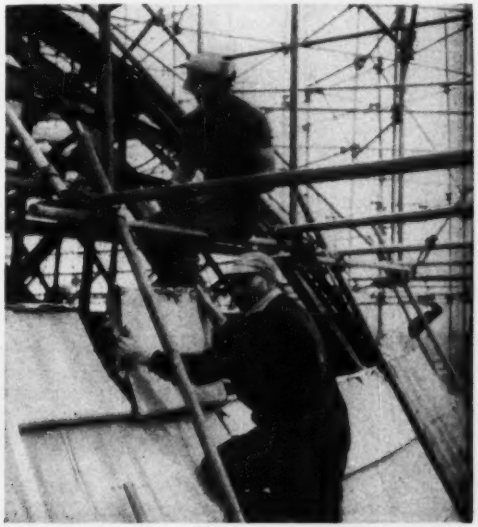


1 BRICKLAYING is speeded by sectional frame scaffolds built up as the work progresses. The frames can be fitted with brackets to provide a wall-side working platform at any height.

2 SHORING of forms is easy job with prefabricated sectional scaffolding that cuts erection time. Screw-base legs give exact height adjustment without wedges, permit rapid form decentering.



3 SUPPORTING the runways over which concrete is wheeled from hoist tower to forms is another use for the sectional type.



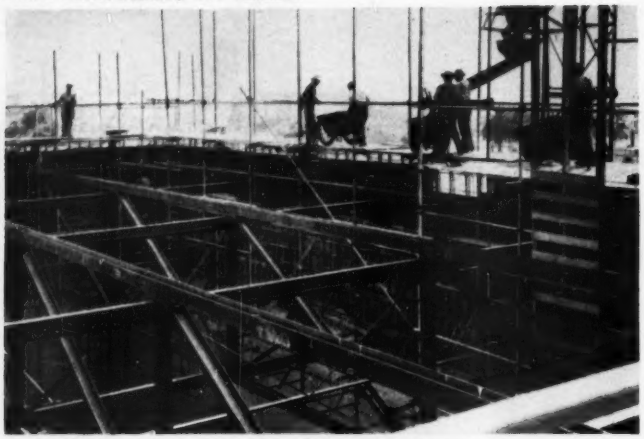
4 SURROUNDING of odd shapes (facing page) calls for tube and coupler type. This cantilevers 31 ft. doesn't touch roof at all.

MODERN STEEL SCAFFOLDS, designed, tested and built by experts, have many advantages over the old-fashioned built-on-the-job wood scaffolds which they have largely replaced. Among them are: (1) safety for the worker; (2) lower scaffolding costs; (3) decreased fire hazard; (4) improved appearance.

Most types of steel scaffolding equipment can be either purchased or rented. Generally speaking, because of the investment involved, purchase is not to a contractor's advantage unless a steady volume of work lets him keep his scaffolds pretty continuously busy on a succession of jobs. Many construction firms buy a reasonable quantity of scaffolding and augment it by rental to suit varying needs.

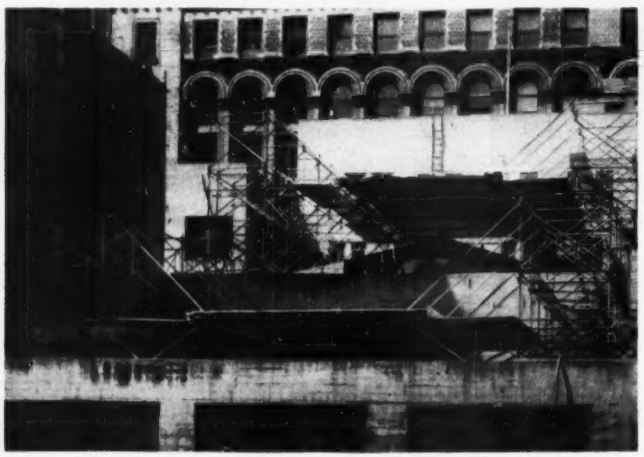
Then, too, complete scaffolding services are available. This includes layout, erection, inspection by the scaffolding contractor during the job, dismantling, and reconditioning when the work is completed.

All these advantages of steel scaffolds are well known to the progressive contractor. Many still may be unfamiliar with the wide



5 DELIVERING concrete to high wall forms is no problem when buggy runways are supported by tube and coupler components. They also aid in form erection and stripping.

6 BRIDGING sidewalks to protect passersby from such light overhead work as painting, cleaning or sandblasting is a simple job with canopy of tube and coupler scaffold.



7 PROTECTING large skylights next to new construction is the task given these elaborate tube and coupler assemblies. Versatile units' list of uses is almost endless.

range of modern scaffolding available, however, or may not know of the new uses to which it has been put in recent years to cut costs and get the job done faster and with greater safety.

In general, present-day steel scaffolds for the construction industry fall into three main classifications:

(1) *Built-Up Scaffolds*—These, as the name implies, are built up from the ground or floor, often as the work progresses. They can be made up either of sectional frames or from tubes and couplers.

(2) *Hanging Scaffolds*—This type falls into two categories: heavy-duty suspended equipment and light-duty swinging scaffolds.

(3) *Rolling Scaffolds*—Easily movable units can be made by fitting casters to either of the two types of built-up scaffolding, or to special aluminum components.

• **Sectional-frame scaffolding,** one of the built-up types, is erected from prefabricated, welded tubular steel transverse frames, or panels. These can be of various designs and heights, but are almost invariably 5 ft wide. The frames are placed one on top of another and are connected lengthwise by pivoted diagonal braces fastened to the frames either by wing nuts or by frame brace locks.

Sectional frame scaffolds are widely used for bricklaying *(Fig. 1)*, stone setting, steeple and tower work, for refacing, plastering, and electrical installations. These are the day-to-day, routine uses. Equally important, perhaps, are the extra-curricular uses for sectional scaffold components. On concrete pouring operations, for example, they can support the forms *(Fig. 2)*, or make a concrete wheeling scaffold *(Fig. 3)*.

To get all the safety that is built into sectional scaffolds, follow these recommendations:

1. Observe manufacturer's instructions regarding maximum load.

2. Use 2-in. scaffold grade lumber, or heavier, for platforms.

3. Tie the scaffold into the building every 20 ft of height and every 25 ft of length.

4. Install guard rails and toe boards.

5. Use suitable overhead protection against falling objects.

(Continued on page 69)

Scrapes and hauls 13-yard load

...with help of TIMKEN® bearings

THIS Be-Ge Model ST-85130 Speedhaul scraper can scrape and haul a 13-yard load of dirt. To keep it on the job with less time-out for maintenance and lubrication, The Be-Ge Mfg. Co., Gilroy, Calif., mounts the wheels on Timken® tapered roller bearings.

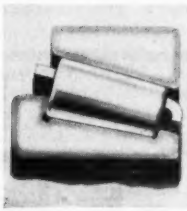
Be-Ge has found that closures are more effective because Timken bearings keep housing and shaft concentric. Dirt, mud and water are kept out —lubricant is kept in. Lubrication and maintenance time are reduced, scrapers are ready to go when needed.

Due to line contact between the rollers and races, Timken bearings have the tremendous load-carrying capacity needed for heavy-duty scrapers. The tapered construction of Timken bearings enables them to take radial and thrust loads in any combination. And friction is practically eliminated because of the incredibly smooth surface finish and true rolling motion of Timken bearings.

No other bearing gives you *all* the advantages you get with Timken tapered roller bearings. Make sure you have them in all the equipment you build or buy. Always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **THE BE-GE MANUFACTURING COMPANY** mounts Timken tapered roller bearings in the wheels of its Speedhaul scraper.



GREATER LOAD AREA

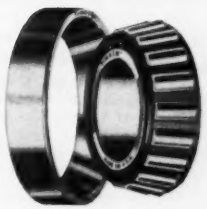
Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◫ AND THRUST ◫ LOADS OR ANY COMBINATION ✳

BRASS and BRONZE CONSTRUCTION

Precision-Engineered Berger "N" Line

Convertible Transit-Level
For laying out and measuring horizontal and vertical angles, leveling, measuring differences in elevation, setting building lines, plumbing walls and columns. 12" erecting-internal focusing, hard bronze telescope; rack and pinion adjustment; 22 power coated optics; steel spindle. Verniers read to 5 min. Dust protected leveling, clamp and tangent screws. Steel carrying case. Code name COTRA.

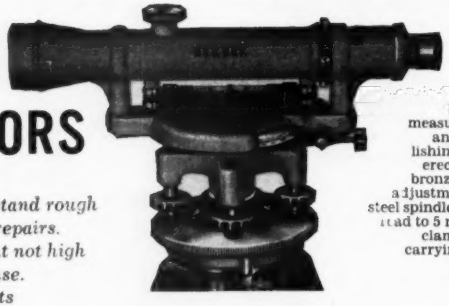
Contractors told us what they needed...

Builders told us what they wanted...

BERGER engineering did the rest...

developed this

NEW MODERATE-PRICED INSTRUMENT LINE for BUILDERS and CONTRACTORS



Heavy Duty 12" Dumpy Level
For setting grades and lines, measuring or laying off horizontal angles, running profiles, establishing foundation elevations. 12" erecting-internal focusing, hard bronze telescope; rack and pinion adjustment; 22 power coated optics; steel spindle; horizontal circle. Verniers read to 5 min. Dust protected leveling, clamp and tangent screws. Steel carrying case. Code name CODEL.

They wanted instruments that would stand rough usage—without being down for costly repairs.

Accurate performance, of course, but not high cost... simple construction, handy-to-use.

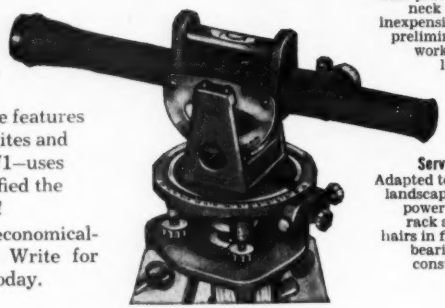
ABOVE ALL... *they wanted instruments priced to fit their budget.*

Berger put its 80 years of precision engineering knowledge to work—field-tested each improvement—checked reactions of contractors, builders, engineers for several years—produced the Berger "N" line of builder's instruments, of brass and bronze construction, precision-engineered but moderate in price.

The "N" line* incorporates many of the features for which Berger transits, levels, theodolites and alidades are famous—have been since 1871—uses the same materials. We've merely simplified the design to build this moderate-priced line!

You'll want to know more about these economical-to-buy, economical-to-use instruments. Write for literature and complete specifications—today.

Berger Hand Level
New, exclusive development. All parts *permanently* fitted...cannot go out of adjustment. Stabilized internal focusing. Interior permanently mounted level vial. *Fully dust-protected.* 6½" long. Attached neck cord. Modern, convenient, inexpensive leveling instrument for preliminary surveys, construction work, road building. Top grain leather case with belt loop. Code name MANLE.



Service Transit-Level (Farm Level)
Adapted to needs of builder, farmer, landscape gardener, carpenter. 10-power, 10½" erecting telescope; rack and pinion focusing. Cross hairs in fixed focus. Dust-protected bearings. Tripod legs of 1-piece construction with metal shoes. Steel carrying case. Code name CERLE.

Complete instruction manual with each instrument.

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THE BEST IN SIGHT IS

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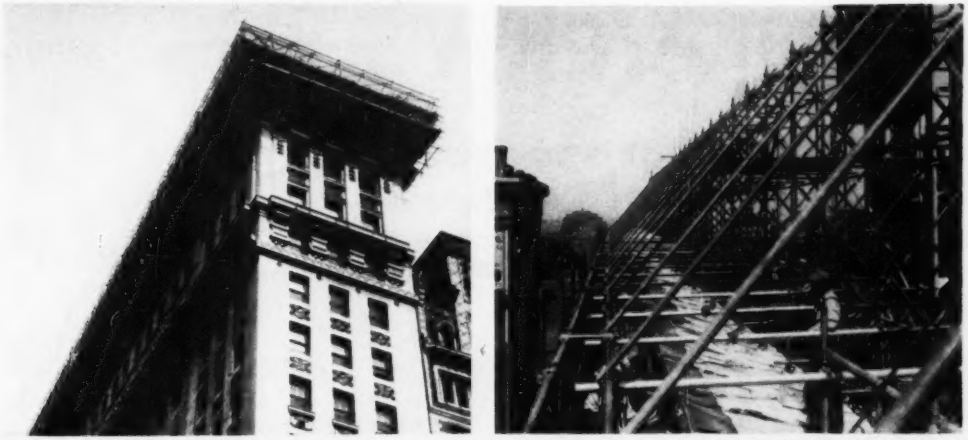


8 & 9 REPAIRING a high cornice can be safely done from tube and coupler outrigger scaffold that saves expense of building one from ground up. The working platform below cornice is suspended from cables running to the top of scaffold frame-work.

6. While scaffold is in use, do not allow any structural part of the scaffold to be removed without permission from proper authorities.

7. Use enough bracing to insure stability and good working conditions.

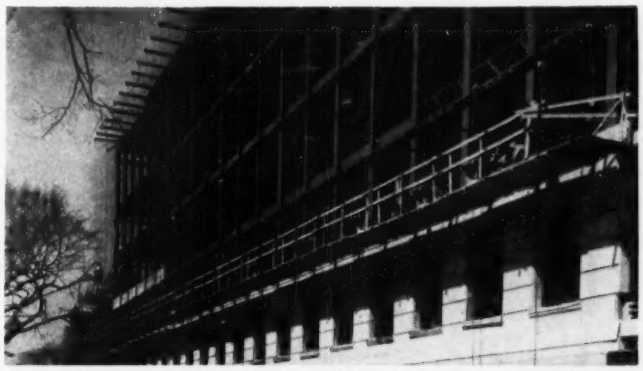
8. Inspect scaffold when it is erected, and continue periodic inspection during use.

• **Tube and coupler scaffolding,** the other built-up type, gives maximum versatility. This equipment has been used on just about every type of building and for almost all construction trades. It is erected from only four basic parts—galvanized steel tubes of various lengths joined by fittings which lock to make a continuous tube; a standard, right-angle coupler for joining members at right angles; adjustable couplers for joining members at other than right angles; and bases, on which the scaffold is erected. The tubes are usually 2 or 2½ in. in diameter and from 6 to 13 ft long.

Tube and coupler scaffolds are the most versatile because working levels can be established on any interval, and because braces can be set at any point. Curved surfaces, extreme height, uneven ground, and building set-back are no problem with this type of equipment.

Tube and coupler scaffolds are widely used for building renovations and refacing work *(Headpiece and Fig. 4)*. Many other contractors have found that there is virtually no limit to what tube and coupler scaffolds can do. They are used for concrete wheeling scaffolds *(Fig. 5)* and as light-duty sidewalk canopies to protect passersby from falling objects *(Fig. 6)*. And, speaking of canopies, tube and coupler scaffolds have even been erected to protect skylights during construction of nearby buildings *(Fig. 7)*. Outrigger scaffolding *(Fig. 8 and 9)* is another unusual application of tube and coupler equipment.

All the safety precautions enumerated for sectional scaffolds should be followed when using the tube and coupler type. In addition, the scaffold should be checked after erection to insure that joints between connecting tubes are locked, as indicated by match marks on the members.



10 SETTING of stonework is handled from heavy-duty scaffolding machines suspended from I-beam outriggers. Material is delivered to platform from building's floors.

• **Heavy-duty suspended scaffolds** use steel wire rope, wound on a ratchet drum mechanism, as a raising and lowering device. The scaffolds are generally suspended from steel or aluminum outrigger I-beams, with each beam supporting two of the hoist mechanisms *(Fig. 10)*. Pairs of drums and their connecting putlog are spaced not more than 9 ft apart lengthwise to accommodate 12-ft planks with which the platform is decked solid. Standard platform width is 5 ft.

Suspended scaffolds are widely used for bricklaying on steel or concrete frame buildings, yet, like built-up scaffolds, they have extra-curricular uses too. With the outriggers mounted on wheels, they

(Continued on page 72)

meeting the need for extra width with the

JAHN MODEL 410 WIDE PLATFORM TRAILER

The Jahn 410 Trailer is our answer to your problem of hauling extra wide equipment. Here is 8-feet of platform width to safely carry rolling stock from job-to-job.

The platform has been designed for easy loading with the rear half of the trailer sloped to a gradual incline . . . no more time consuming difficulties in getting your equipment aboard outmoded and unsafe trailers. The Jahn 410 is quick, safe and sure from loading to unloading. You owe it to yourself to know this unit better, so fill out the coupon and mail it today!

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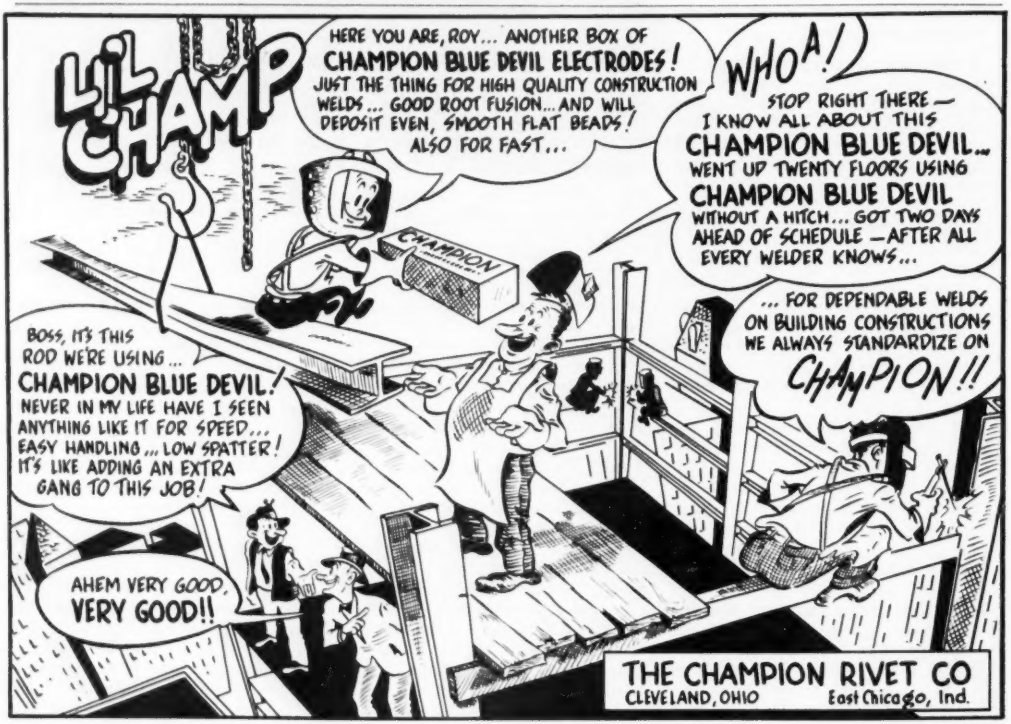
LIL CHAMP
HERE YOU ARE, ROY... ANOTHER BOX OF CHAMPION BLUE DEVIL ELECTRODES! JUST THE THING FOR HIGH QUALITY CONSTRUCTION WELDS... GOOD ROOT FUSION... AND WILL DEPOSIT EVEN, SMOOTH FLAT BEADS! ALSO FOR FAST...
WHOA!
STOP RIGHT THERE— I KNOW ALL ABOUT THIS CHAMPION BLUE DEVIL... WENT UP TWENTY FLOORS USING CHAMPION BLUE DEVIL WITHOUT A HITCH... GOT TWO DAYS AHEAD OF SCHEDULE —AFTER ALL EVERY WELDER KNOWS...
CHAMPION
BOSS, IT'S THIS ROD WE'RE USING... CHAMPION BLUE DEVIL! NEVER IN MY LIFE HAVE I SEEN ANYTHING LIKE IT FOR SPEED... EASY HANDLING... LOW SPATTER! IT'S LIKE ADDING AN EXTRA GANG TO THIS JOB!
... FOR DEPENDABLE WELDS ON BUILDING CONSTRUCTIONS WE ALWAYS STANDARDIZE ON CHAMPION!!
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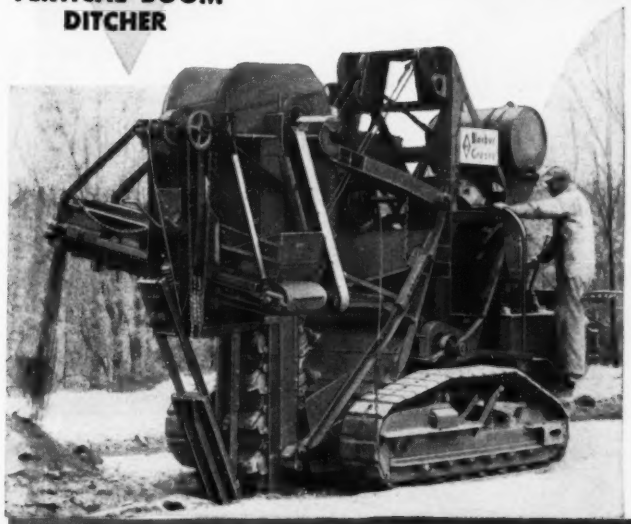
MODEL 44-C VERTICAL BOOM DITCHER

for lowest cost per foot of trench in all weather



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- **Placing Conduit Tile**
- **Building Foundations**
- **Farm Tiling**
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DIGS CLEAN... leaves vertical walls . . . square cuts . . . eliminates most expensive handwork.

MILLING ACTION... closely spaced buckets pare small increments as a milling machine cuts metal.

OVERLOAD RELEASE... slips when overload occurs . . . automatically re-sets itself . . . no down time for replacing shear bolts, etc.

Only Barber-Greene offers so many proved ditcher advantages to save time and money on all trenching operations. For instance, the Vertical Boom means a compact, easily maneuvered machine: digs straight down, right up to walks, foundations, underground pipes, etc. . . . digs *all* the ditch . . . no expensive handwork required. The Vertical Boom stays *down* — the harder the digging, the harder the buckets hold it down. Cuts trench to 8'-3" depth, 24" wide.

Self-cleaning "kick-out" buckets operate in a vertical plane . . . produce the famous B-G milling action that cuts through coral, frozen ground, caliche and other formations that completely stop other ditchers.

Another time- and money-saving feature is the exclusive B-G overload release that slips on overload and automatically resets itself until the obstruction is removed or the operator stops machine—and then it re-sets itself for continued operation, protecting machine, hidden mains, cables, etc.

Plan to put the advantages of the B-G Model 44-C to work for you.

Barber-Greene

AURORA, ILLINOIS, U.S.A.

11 HANGING from the roof's steel framework, cables and drum mechanisms taken from some heavy duty suspended scaffolding equipment support a platform from which the ceiling of a large theater will be plastered. It's as simple as that.

12 PAINTING the towers of the Golden Gate Bridge in San Francisco is done from light-duty swinging scaffolds. This type of equipment has only a single drum at each end.

have proved handy for cornice removal work. Ceiling suspended scaffolds *(Fig. 11)* show another use for this type of equipment.

When erecting suspended scaffolds, keep these safety precautions in mind:

1. When overhead work is in progress, install suitable protection against falling objects. Overhead attachments are furnished for such protection.

2. Inspect scaffold drum mechanism, wire rope and entire scaffolding periodically.

3. Use guard rail and make sure it is kept in good condition.

4. Install toe boards to prevent materials and other objects from falling from the scaffold.

5. Where I-beams used to suspend machines are rigged over the parapet wall, make sure that the parapet will carry the load of the outrigger and scaffold, or that suitable bench or blocking is installed.

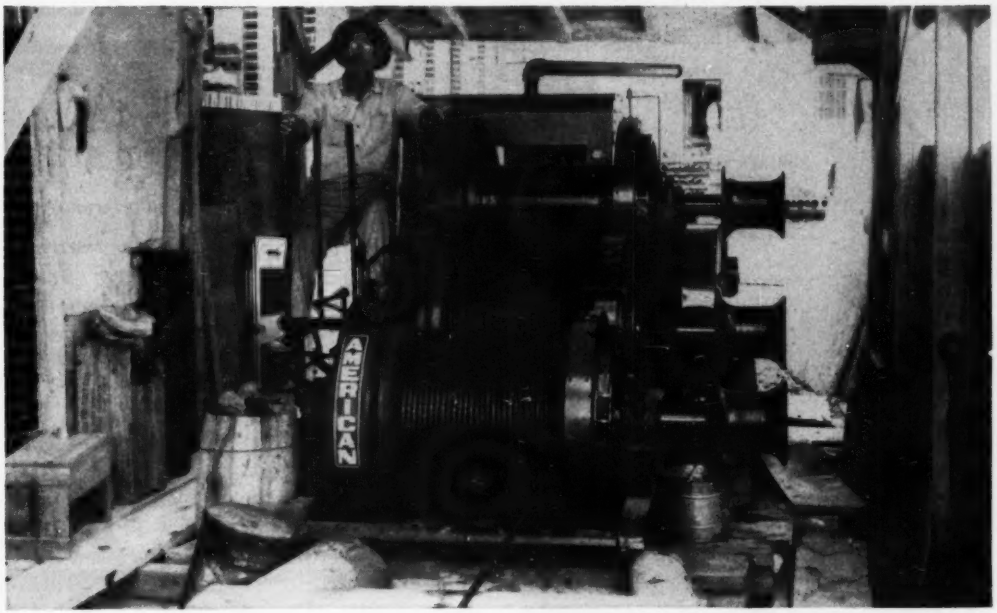
6. Do not overload scaffold.

7. Overlap planks at least 1 ft on each side of the bearer or putlog.

8. Make sure that the wire ropes

(Continued on page 74)

Outselling all others



THIS year, as for many years past, contractors are buying more American construction hoists than those of any other make. We make this statement not as a matter of pride for us (although it is) but as a clue to smart purchasing for you.

The picture above shows a 3-drum Model 75 American General Purpose Hoist, owned by R. P. Farnsworth & Co. Inc., New Orleans, at work on a new dormitory at Tulane University. It is one more proof of the fact that experienced, successful builders—who know their costs down to the penny—have a distinct preference for American hoists.

A full list of the "reasons why" would show dozens of design features, engineering features, assembly features quite different from those of other hoists. But the simple facts are that American hoists work better on the job, stay on the job longer, and —most important of all—*make more money for their owners*. That's why they outsell all others.

Is this the kind of equipment you want? If so, choose your next hoist from the world's broadest line, through your American distributor.

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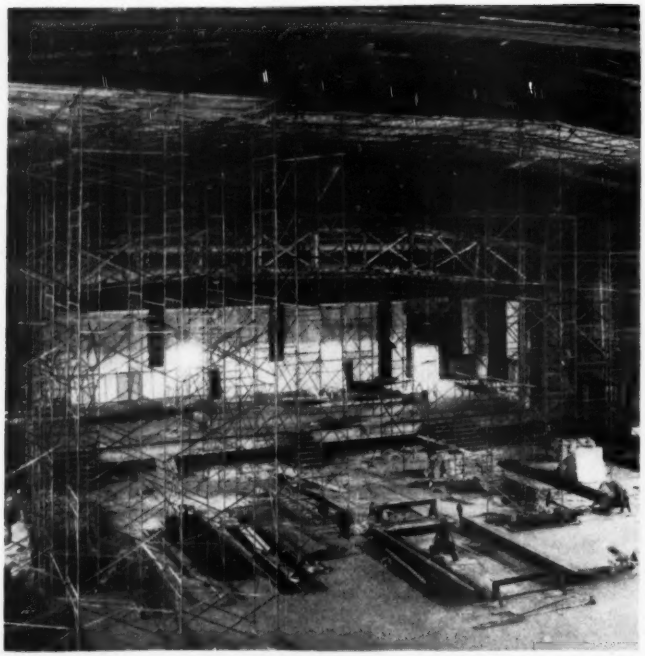


13 PLASTERING an acoustical ceiling in this level-floored auditorium calls for two 44-ft-high rolling scaffolds (left foreground) in addition to fixed scaffolding.

are always hung perpendicularly.

• **Swinging scaffolds**, which also employ steel wire rope and a mechanical raising and lowering device, are for light duty. They are fitted with only one cable and hoist mechanism at each end of a prefabricated stage, which is generally 16 to 22 ft long and from 20 to 28 in. wide. Swinging scaffolds are used for stonesetting, glazing, pointing up or washing down masonry, and erecting or stripping concrete forms.

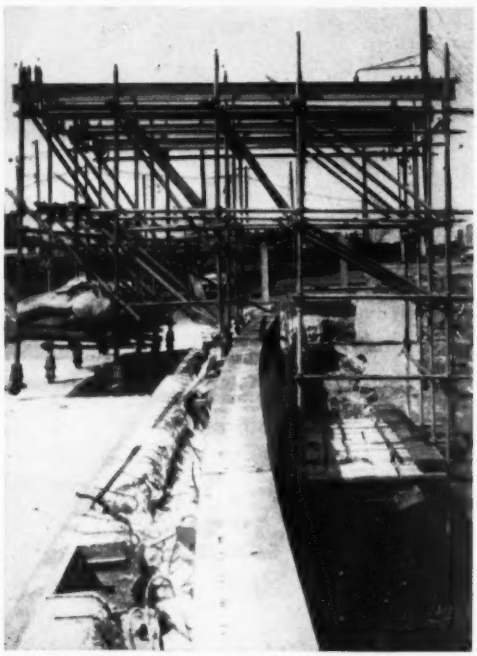
Here again, alert contractors have found these scaffolds useful for other types of work. One is for bridge painting and repairs *(Fig. 12)*.

For safety when using swinging scaffolds:

1. Test the platform, before being used, by supporting it 18 in. in from each end and having two men stand in the middle.

2. Inspect raising and lowering mechanism frequently.

3. Remember that this is a light-duty scaffold, designed primarily for operations involving men and hand tools with a minimum of materials, so don't overload it.



14 BREAKING concrete from girder for viaduct change is done from a counterweighed tube and coupler rolling scaffold.

4. Be sure there are at least three turns of wire rope on drums at all times. Do not lower the scaffold below this point.

5. Equip the stage with toe boards and guard rail, properly supported at both ends and in the center.

• **Rolling scaffolds** can be erected from sectional steel scaffolding units *(Fig. 13)* or from tube and coupler scaffolding components *(Fig. 14)* fitted with casters. In addition to these, there are two types of aluminum equipment. Aluminum sectional rolling scaffolds are made up of end frames and braces, generally have base dimensions of 4½x6 ft, and are designed with an interior stairway. Aluminum sectional ladder scaffolds are erected from 2-ft wide ladder units of various heights.

Four basic safety suggestions should be followed with rolling scaffolds:

1. Do not erect a rolling scaffold higher than the local code permits, in ratio to base area, or higher than recommended by manufacturer.

2. Avoid overloading, which is a frequent cause of trouble and expense.

3. Take precautions to prevent scaffold from being struck by trucks or other equipment.

4. Erect guard rails around working platforms.

5. Do not roll the scaffold with workmen on it, and do not allow workmen to pull themselves along while on top of scaffold.

The Euclid Loader working with Bottom-Dump "Eucs", has set production records on many big yardage jobs. On this highway project "Eucs" were loaded with 13.6 bank cu. yds. in about 35 seconds.

Bottom-Dump "Eucs" have struck capacities of 13 to 25 cu. yds. . . . diesel engines of 190 to 300 h.p. . . . top speeds loaded up to 34.4 m.p.h.

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Rear-Dump Euclids range in capacity from 10 to 34 tons . . . top speeds loaded up to 36.3 m.p.h. . . . diesel engines of 125 to 400 h.p.

● Proof that Euclids are engineered and built for long life performance in off-the-highway service is found in the record—of the thousands built, more than 9 out of 11 "Eucs" are still in use!

Engineered and built for lasting strength, Euclids are job proved for continuous operation, less down time and lower maintenance costs on a wide range of construction, mining and quarry work.

Ask your Euclid Distributor about the Euclid features that mean more loads per hour at more profit per load—large capacity, power and traction for steep grades, and speed on the haul road.

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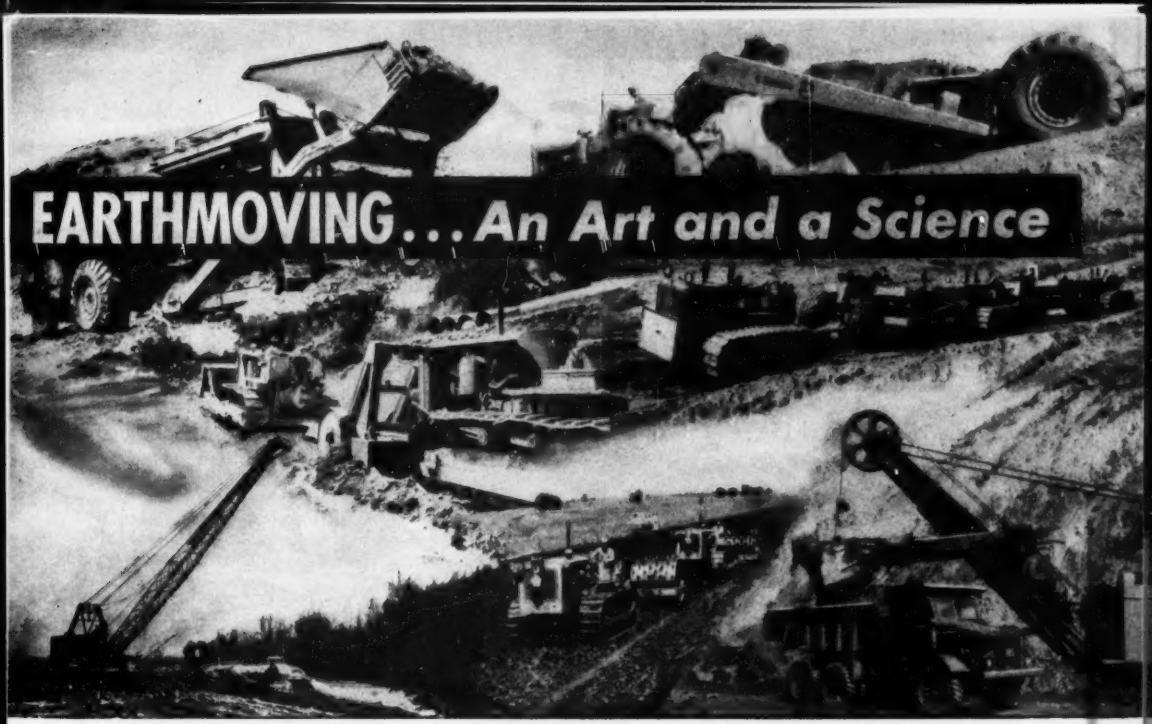


17. Excavator Operating Costs

By E. O. MARTINSON, Vice-President, Engineering, Koehring Co.

IT IS DIFFICULT to predict average excavator operating costs. There are hundreds of factors which may affect these costs. Though many factors must be estimated, certain useful comparisons may be made to determine the best size machine for the job.

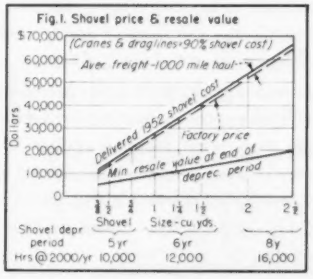
A study of these cost factors will show their relative importance. Even though estimated, they may serve as a guide. On jobs under excellent management and with careful operators some of the costs may be far less than shown in these charts. On others, carelessness and bad luck, abetted by forcing the equipment, may run the costs higher than shown. Some factors will be higher and others lower than charted, but total hourly costs should be within the total shown on the charts.

Maintenance costs shown are not based on any accumulated data. They are estimated as to what might be reasonable on average shovel work from a study of contractors' records and some discussion with a few experienced excavator owners—plus an observation of job conditions which cause the wide variations in costs.

Cost Factors

(1) Original cost—*Fig. 1* shows the approximate new delivered price

Fig. 1. Shovel price & resale value



of a diesel-powered shovel, assuming an approximate 1,000-mi freight haul. This price is an average of 1952 equipment prices of several manufacturers. Some makes are higher, some lower, but a 5 or 10% price variation affects the hourly or unit cost very little compared with other factors. Freight charges are a relatively small part of the total price on the average haul, but can be important in transcontinental distances or export.

An estimated resale value also is shown. This is taken to be a minimum resale price after allowable depreciation. These resale values depend to a considerable extent upon the scarcity of new equipment. The resale value shown assumes that the machine has been maintained by replacement expenditures explained under another heading.

If little is spent to keep the machine in good condition, the resale value may be less, but so is the cost of some of the replacement items. If the machine is to be kept in operation for a longer period, its resale value will be less, but then the average depreciation also will be less than shown.

(2) Fixed costs—Fixed costs go on regardless of how much the machine is used. Interest should be considered as a fixed cost. Personal property tax is imposed by local tax units, regardless of machine use. Most owners of valuable machines carry some form of insurance, a part of which at least is a

(Continued on page 79)

This article, the 17th consecutive one in a series on the fundamental principles of earthmoving, is sponsored by the Power Crane and Shovel Association.

NOT FOR THE SHELF...

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Look up Crawlers, or Calcium Greases, or Diesels or whatnot concerning Earth Moving and Construction Equipment. You'll find your subject covered authoritatively and understandably, from mechanical principles to technicalities. You'll realize that your up-to-the-minute Cities Service book of 56 pages, with sharp drawings and photos, has been developed to broaden your own fundamentals of lubrication *whys, hows and whats.*

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QUALITY PETROLEUM PRODUCTS

EARTHMOVING . . . Cont. from p. 77

fixed cost. Depreciation goes on, even if a machine is not used. Depreciation is greater with use due to natural wear and tear, but to keep the analysis as simple as possible, depreciation is considered a fixed cost.

(2a) DEPRECIATION CHARGES, to be conservative and safe in arriving at a final unit cost, are taken at the highest permissible rate suggested by the U. S. Department of Internal Revenue. A fast write-off usually is desirable because of the uncertainties of business conditions, and it may be best to charge as much depreciation as permissible while the machine is in good productive condition and in use.

On long, stabilized operations it may be preferable to take a lower depreciation rate. But, for this article, the maximum permissible rate is used. The U. S. Treasury

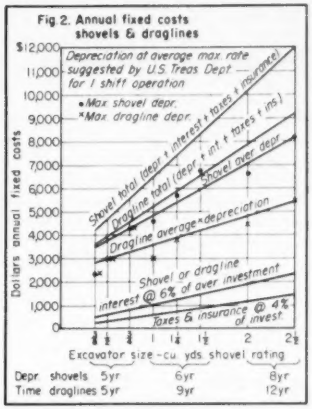
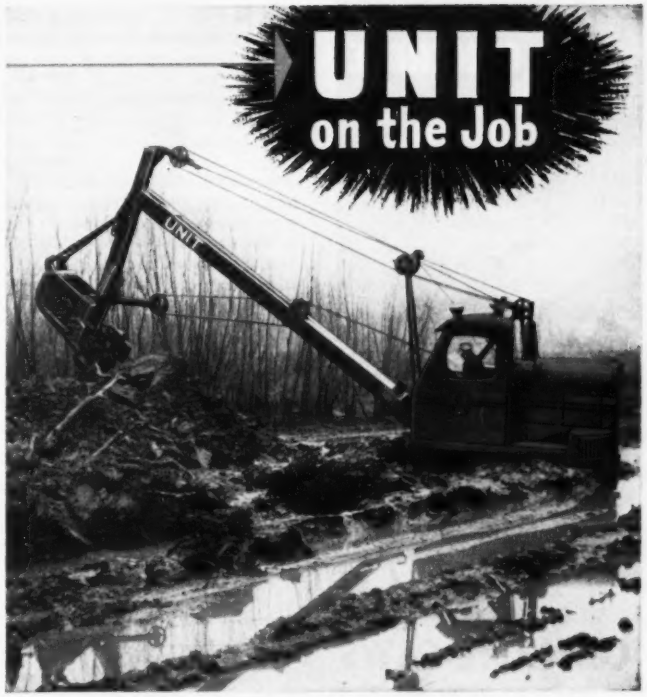


Fig 2. Annual fixed costs
shovels & draglines
Depreciation at average max. rate suggested by U.S. Treas. Dept. — for 1 shift operation
•Max. shovel depr.
×Max. dragline depr.
Shovel total (depr + interest + taxes + insurance)
Dragline total (depr + int + taxes + ins.)
Shovel depr.
Dragline average depreciation
Shovel or dragline interest @ 6% of aver. investment
Taxes & insurance @ 4% of invest.
Dollars annual fixed costs
Excavator size—cu. yds. shovel rating
Depr. shovels 5yr 6yr 8yr
Time draglines 5yr 9yr 12yr

Department suggests lower rates for draglines and clamshells than for shovels and hoes. These rates are shown at the bottom of *Fig. 2.*

Depreciation in dollars per year plots as a jagged line, but it is averaged out as straight lines of uniformly increasing amounts, varying with machine size to keep the analysis simple and uniform. It will be noted that the depreciation for a ¾-cu yd dragline could be charged at about $4,300 yer yr, but the larger 1-cu yd dragline would have to be charged off at no more than $3,000 per yr—which is not logical.

(2b) INTEREST is charged at 6% of the average investment, because this is the usual interest on equipment loans and is about the return to be expected on reliable stocks. The average investment over the depreciation period or "book life" of the machine is fig-



TOUGH GOING . . . and no doubt about it! Here's a UNIT Excavator that's really *IN* but still *ON* the job. Regardless of the swampy ground, there's always plenty of power to provide dependable crawler traction. UNIT machines are designed for just this type of performance under difficult conditions.

The famous UNIT One-Piece Gear Case assures perfect alignment of all working parts. Twin Hook Rollers . . . Automatic Traction Brakes . . . Interchangeable Disc Clutches plus quality construction make it possible for UNIT to meet the most rigid demands. The streamlined FULL VISION CAB provides maximum visibility in all directions, assuring SAFE and EFFICIENT operation.

A comparison will prove you just can't beat UNIT for SPEED, FLEXIBILITY and TROUBLE-FREE performance at low cost.

SEE FOR YOURSELF: *Let us send you our novel TV Brochure. It illustrates the complete UNIT line.*

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CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

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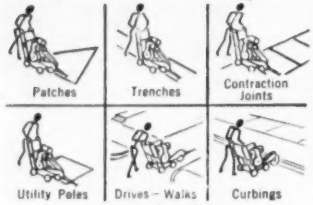

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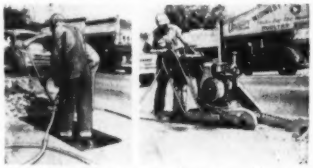

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ured as follows, assuming a small machine which is to be depreciated in 5 yr:

Year	Investment	Amount Depreciated
1st	100%	20% of cost
2nd	80%	20%
3rd	60%	20%
4th	40%	20%
5th	20%	20%

AVERAGE INVESTMENT: Total 300% ÷ 5 yr = 60% of cost. Other average investments would be as follows:

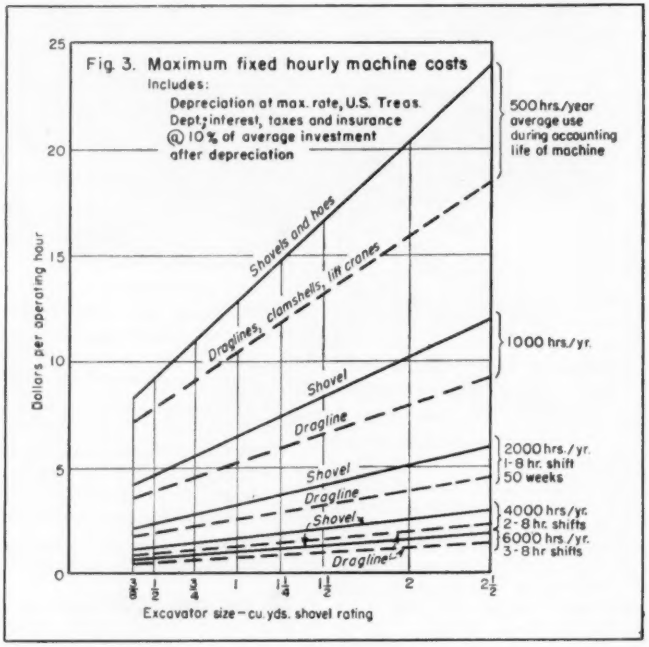
Years Depreciation	% Average Investment Per Year
5	60 % of cost
6	58.3% of cost
8	56.2% of cost
9	55.5% of cost
12	54.2% of cost

Actually, there would be little error in estimating costs if 50% of the original cost were assumed as being the average investment, regardless of depreciation time. Average interest during the "book life" is then 6% of the average investment.

(2c) TAXES AND INSURANCE are combined into one item and assumed as being 4% of the average invested capital. This amount will vary with locality and assessors and probably will cover only fire and storm damage insurance. Theoretically, both the interest and tax items are higher cost items during the first year of operation and would become less each year, but for the purpose of this study, they are averaged out over the "book life." The higher early interest and tax in early years probably are more than offset by a lower repair cost when relatively new.

(2d) TOTAL ANNUAL FIXED COSTS for both shovels and draglines also are shown on *Fig. 2*. These fixed costs would assume that the machine was fully depreciated during approximately the amortization period shown at the bottom of *Fig. 2*, except that the amortization was averaged slightly to get straight line curves.

If the machine is properly maintained, it will have a substantial resale value at the end of the depreciation period so the actual fixed costs are not as high as the total indicate, and this resale value is accounted for in determining hourly costs.



(3) Hourly fixed costs — *Fig. 3* shows the effect of number of hours used on the hourly fixed costs. These charts assume the same depreciation rate for the three-shift operation as for the single-shift operation. The depreciation rate probably should be increased for the two- and three-shift operations, but the maximum allowable increase in depreciation rate for

two-shift operation would change the hourly cost for 4,000 or 6,000 hr but very little, and it does not appreciably affect the cost per cubic yard.

When a machine is used for an average of only 500 or 1,000 hr per year during its depreciation life, the hourly fixed costs begin to mount, but again it must be realized that the depreciation rate is being taken at the maximum allowable amount. There would be less wear, and therefore the machine should have a relatively higher resale value. But, somewhat like used automobiles, the resale value does not always depend on mileage so much as age. Therefore it is safer to assume the full depreciation rate. On the other hand, being too safe may make the bid so high as to lose the contract award.

Draglines have a lower hourly fixed cost because Treasury regulations require a lower depreciation rate than for hoes and shovels, probably because dragline service is easier on the machine. Clamshell cranes would be the same as a dragline. Crane depreciation rates in Treasury regulations are based on tonnage rating which varies so much according to the radius of load, counterweight and crawler width, that cranes for the purpose of this cost study are grouped with draglines and clamshells.

(4) Variable costs—The total cost of fuel, lube oil, supplies, repairs, labor supervision and overhead are more or less in direct proportion to the number of hours the excavator is used. For this study variable costs are divided into three main sub-groups: Fuel, machine variable cost and labor.

(4a) FUEL AND OIL CONSUMPTION

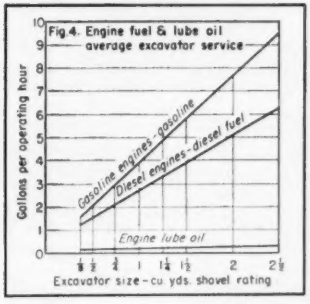


Fig. 4. Engine fuel & lube oil average excavator service
Gallons per operating hour
Gasoline engines—gasoline
Diesel engines—diesel fuel
Engine lube oil
Excavator size—cu. yds. shovel rating

for both gasoline-powered and diesel-powered excavators is shown in *Fig. 4* as gallons per hour. These figures are based on studies of average shovel performance. Dragline and clamshells would use about the same amount of fuel. The engine runs at full load only a small part of the time, and the fuel used is considerably less than when the engine is run near its full power rating continuously, as when powering pumps or generators. Lift cranes would use even less fuel.

It is assumed that the oil is changed about every 100 hr and that the make-up lube oil during this 100-hr period amounts to about half the crankcase capacity. Many operators run their engines 200 hr or more when using the "heavy duty" or "superior" grades of oil, depending on dust conditions, lube-oil filter changes and the quality of fuel used. Most engines would have less make-up lube oil than assumed. These assumptions may put the estimated cost on the high side, but lube oil is a small part of operating cost.

The hourly cost of fuel and lube oil is shown on *Fig. 5*, p. 82 and is obtained by multiplying the values of *Fig. 4* by the assumed cost per gallon shown on each of the curves. These would be typical costs of fuel delivered to the machine in

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most parts of the U. S. Grease and gear oils are but a small item in the total cost, but should be considered.

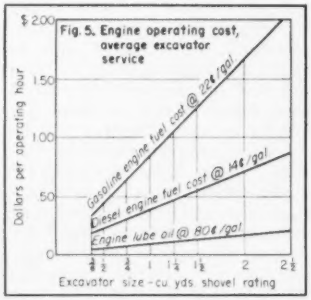

Fig. 5. Engine operating cost, average excavator service

(4b) MACHINE COSTS, maintenance, repair and supplies are truly variable. They will vary more from one make of machine to another, from one job to another, from one operator to another and from year to year than any other cost factor.

It has been suggested in the past that the repair, maintenance and supply cost total be made equal to the depreciation of the machine. But depreciation is an amount more or less constant per year. Repair and maintenance items depend more on the usage of the machine. It is not logical to make the two items equal.

Engine maintenance is taken to include minor repairs, changes of filters, and the cost of periodic engine overhaul. Thus for the 2½-cu yd excavator, it might be assumed that an engine overhaul (including the installation of new cylinder sleeves, piston rings, injector renewal, new connecting rod bearings, main bearings, new exhaust valves and re-ground inlet valves) might run $2,000 after 5,000 hr of operation. There would be another $500 for other daily maintenance during this 5,000-hr period to cover such items as some 20 changes of oil filters, 5 or 10 changes of fuel filters, plus a few minor repairs. This $2,500, divided by 5,000 hr, would give 50c per hr. Many engines run much longer than 5,000 hr on shovels before a general overhaul, but with poor attention they may require a complete overhaul after less service.

Wire ropes in excavator service more often are damaged by overload or cutting than by wear. One operator may get three months of hoist rope life on a shovel where

(Continued on page 84)

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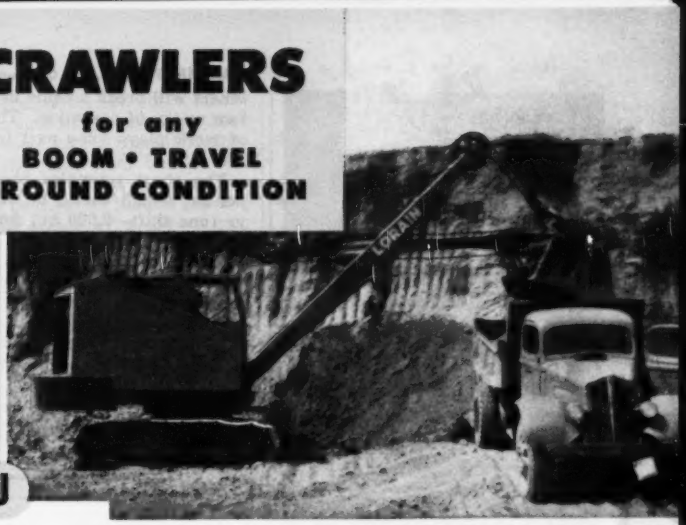

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J

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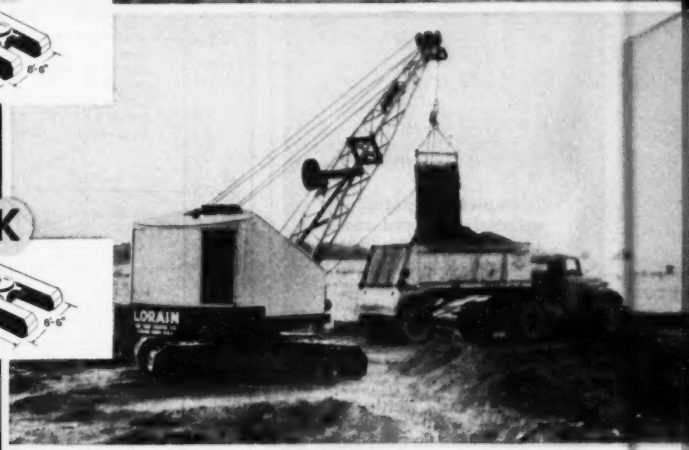
TL25-J Crawler is suited for average job conditions—a good general purpose mounting for all booms. Length—10'0", width—8'6". All TL25 crawlers provide two travel speeds in both directions.



K

EXTRA-LONG

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S

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TL25-S Crawler is the answer for trenching and pipeline needs. Wide distance between treads enables crawler to straddle trench without cave-ins. Especially adaptable to hoe front end. Length—10'0", width—11'8".

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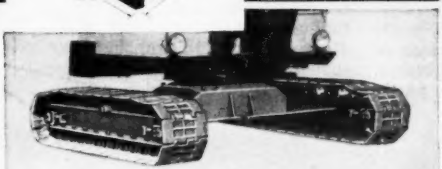
TL25-KS Crawler is 12'6" long—11'8" wide. Provides the surest kind of footing, even in the softest going. Provides greater crane lifting capacities . . . all the advantages of both the "K" and the "S" crawlers.

KS



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others will break a cable in one or two weeks of operation. The type of work plays some part in cable life.

The chart estimates about 12¢ per hr, which would be $240 per yr (one shift—2,000 hr) for a ½-cu yd shovel and up to 40¢ per hr for the 2½-cu yd shovel. Cables usually wear harder on draglines than on shovels.

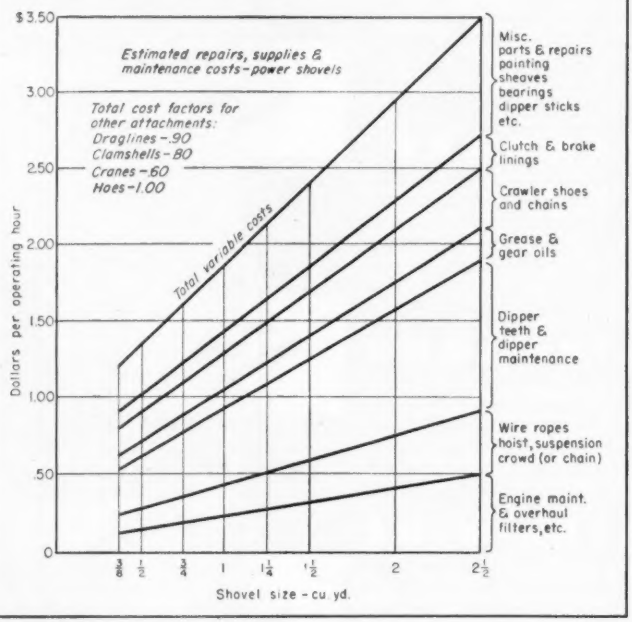
Dipper maintenance cost for shovels is shown in *Fig. 6*. It is assumed to run from about 34¢ per hr for a ½-cu yd shovel to $1 per hr for a 2½-cu yd shovel. Most of this cost would be for the hardfacing and repointing of the dipper teeth, or the purchase of new tooth points. Hard materials not blasted loose run the cost of dipper maintenance higher, and digging in common earth keeps costs lower. Hoe and dragline dipper maintenance should run about the same as for a shovel.

Crawler shoes and traction chains may last the entire depreciation period of the machine before requiring replacement. But if the machine is to be maintained for longer life or good resale value, some provision should be made for this item. On truck cranes or self-propelled, rubber-tired cranes, this item would at least partly cover tire replacement cost for those sizes available in the rubber-tired mountings. This item provides about 22¢ per hr for the ¾-cu yd size ($440 per yr, one shift). Truck cranes travel but little, compared with highway trucks, and this amount should be more than adequate.

Clutch and brake linings, in spite of constant slippage, last surprisingly long if they are of the correct type and grade and are not operated so as to cause excessive overheating. This item is estimated to be from 10¢ per hr for the smallest machines to 20¢ per hr for the 2½-cu yd size for the average shovel application. There may not be any cost for these items during the first year or so on some jobs but, like the cost for crawler shoes, an average amount must be allowed in estimating costs.

Miscellaneous can cover a multitude of items. An occasional gear or sheave may require replacement. A neglected bronze bushing or ball bearing may fail prematurely. Natural wear will require the eventual replacement of many bearings. Overloads will cause fatigue failures of some parts. These parts could be dipper sticks, shovel booms, drumshafts, shipper shafts, car bodies, axles, crawler

Fig. 6. Variable machine costs



frames and similar components.

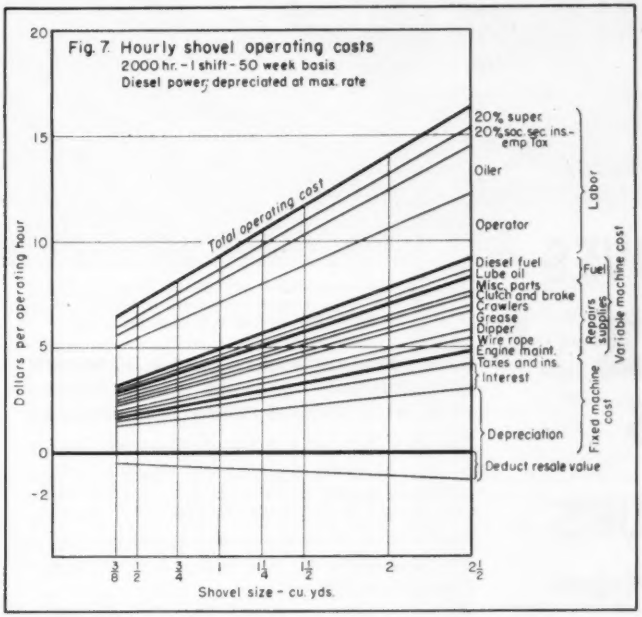
This miscellaneous item would cover rewelding of damaged parts. If a crack in a structural member is repaired promptly, it can prevent complete failure and a more costly replacement. Thus the amount of this cost item will depend on regular inspection of the machine and prompt attention to failures in the bud. Periodic repainting also would be included, perhaps every 2 to 5 yr.

Total variable machine cost is the sum of items under 4b. Based on these assumed hourly costs, the total varies from $1.20 per hr for the ⅜-cu yd excavator to $3.50 per hr for the 2½-cu yd machine, shown as the top line of *Fig. 6*. Cost factors for other types of operation are suggested on the chart. Thus clamshell hourly machine variable cost is estimated to be 80% that of a shovel.

These factors, like other items in the chart, are not based on a collection of data, but on the writer's judgment. They are shown only to recall to operators that other attachments than the shovel may cause less wear and tear in the machine and should be considered in working out estimated costs based on past experience.

(4c) LABOR CHARGES are added to fixed machine costs and variable machine costs to obtain the total hourly operating costs shown in *Fig. 7*. The shovel operator's labor is the largest single cost item. His hourly wage varies from industry to industry and from locality to locality.

It can be assumed that, in general, the operator of a 2½-cu yd machine gets more per hour than the runner of a ⅜- or ½-cu yd excavator. The chart is set up for $3 per hr on the larger machines and $2 pr hr on the smaller. Year-round operations where employment is steady would pay less, as would rural areas with lower living costs. Other sizes are proportioned between these two amounts by making the curve a straight line.



Oiler pay allowed is not necessarily the full pay of an oiler. On small machines it is assumed that oilers are used only on a few machines or one oiler may take care of three or four smaller machines, except where featherbedding rules may apply. On larger machines there is more necessity for an oiler, to reduce the down-time required for oiling. It is more difficult for the operator to care for a large machines by himself, unless he takes out some operating time for lubrication.

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(Continued on page 87)

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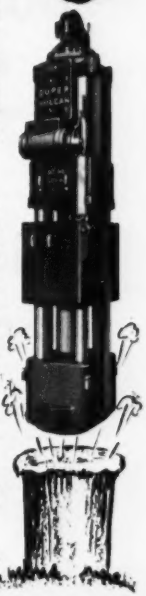

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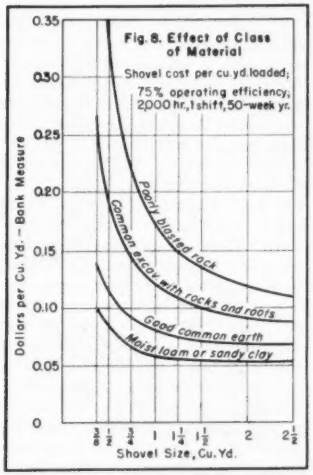
where there are several pieces of equipment, one oiler may efficiently take care of all of them and yet be available at a moment's notice to help the operator change a cable, for example. Centralized lubricating systems further reduce the necessity for oilers, freeing them for more productive and higher paying jobs.

A $2 per hr rate is figured for the oiler on the 2½-cu yd shovel, although this rate would be lower in many areas. This is tapered down to 53¢ per hr on the ⅜-cu yd shovel as a proportionate share of a utility man. The chart, for example, then indicates about $1.30 per hr on a 1½-cu yd shovel.

Workers' benefits such as social security, workmen's compensation, insurance, unemployment tax, vacation pay, payroll expense and lost time are taken as 20% of the sum of the operator's and oiler's pay. Previous estimates of shovel operating cost have put this at 10%, but fringe benefits have become higher each year. It is a sizable item. Vacation pay applies only to year-round operations, but it alone may average 4%.

Supervision charges on an excavator operation should bear a part of the foreman's and superintendent's salary. This is assumed as being about 20% of the sum of the operator's and oiler's pay.



(5) Total hourly operating cost—Total operating cost is found by summing up in graphic form all the operating costs, but deducting a machine resale value prorated to an hourly cost based on 2,000-hr-per-year average usage during its depreciation "economic life." An inspection of *Fig. 7* quickly shows the relative importance of each of the many items of operating cost. It should help in analyzing and estimating operating costs and prevent overlooking of some factors.

(6) Unit loading costs—Using the total cost in *Fig. 7*, it is possible to arrive at a cost per cubic yard of material loaded into trucks as shown in *Fig. 8, 9* and *10*. The hourly costs of *Fig. 7* are divided by the cubic yards per hour shovel output shovel in Table A, page 120 of the March issue of CONSTRUCTION METHODS AND EQUIPMENT.

Unit costs shown in *Fig. 8* are modified further to assume 75% operating efficiency which would allow for total delays for small repairs, waiting for trucks and short moves—a total of 25% of the operating time. This efficiency figure does not include major delays when the machine is not operated at all. It is assumed further that the machine would be operated approximately 2,000 hr per yr gross which, with 75% efficiency, would amount to about 1,500 net operating hours.

This chart shows costs for four

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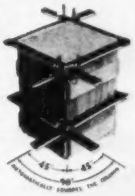

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classes of material and only costs of loading into hauling units. It does not include the cost of auxiliary equipment such as graders, bulldozers or trucks. The most interesting information shown is that for easy digging the cost per cubic yard, using the smaller shovels, is not much more than for larger shovels. For example, for moist loam the chart shows a 7¢ per yd cost for a ¾-yd shovel and about 5½¢ for a 2- or 2½-yd shovel.

But when handling poorly blasted rock, the ¾-yd shovel has a cost of 22¢ per cu yd loaded, whereas the 2½-yd shovel would be only about 11½¢ per yd. Other factors may dictate the desirability of a larger machine even in easy digging. For example, when loading large hauling units, it is desirable to have a large shovel so that there is not too much waiting time by hauling units.

Fig. 9 shows the effect of operating efficiency on the cost per cubic yard of loading. This chart is based on handling common excavation with roots and rocks and again for 2,000 hr per yr total time. It gives an over-all picture of the advantages of high operating efficiency and the approximate cost per yard to be gained by improved efficiency.

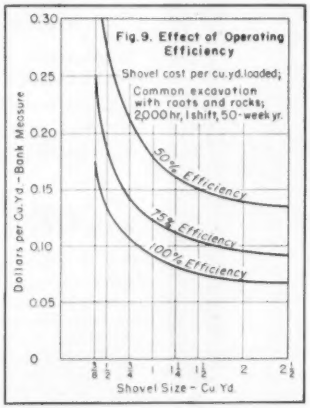
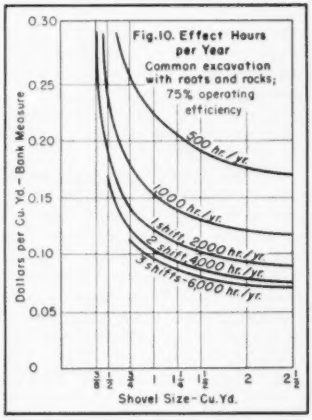


Fig. 10 shows the effect that hours of machine use have on unit operating cost. This chart is a little different from the one on operating efficiency in that if the machine is operated for 1,000 hr per yr, the operator and oiler are paid only for 1,000 hr and maintenance and repair costs are based on 1,000 hr. Again 75% operating efficiency has been assumed, with type of digging being common excavation with rocks and roots.

This chart shows, for example, a difference of around 2¢ per yd for one shift 2,000 hr per yr and two shifts 4,000 hr per yr. But the cost is less than 1¢ per yd lower for the three-shift operation than for the two-shift operation. This chart also shows how the cost can rise when the machine is used only part of the year, even though there is



no maintenance or operator cost. On the other hand, it would show that a 2½-yd shovel when operated only 500 hr per yr would load this type of material at about the same cost as a ½-yd shovel operating 2,000 hr a yr.

It must be cautioned that the three charts allow nothing for profit or major contingencies to cover the risks involved in operating an excavating business. But they do serve as a comparison of the relative cost for various sizes of machines and the relative cost of various operating conditions.

(7) Cost records—In recent years some contractors and machine owners have begun to keep more complete cost records. It is difficult to know how to reduce costs, unless some analysis or study is made of them. Purchased repairs and supplies may easily be totaled for the year, but most times it is difficult to allocate costs to individual machines. Seldom is the time spent by the oiler and operator changing cable or making repairs shown separately from operating cost. Parts purchased for stock may be charged to repair cost, whereas they should not be so charged until actually installed.

To get a more accurate record, a clip-board could be installed inside the machine and a form simi-

(Continued on page 90)

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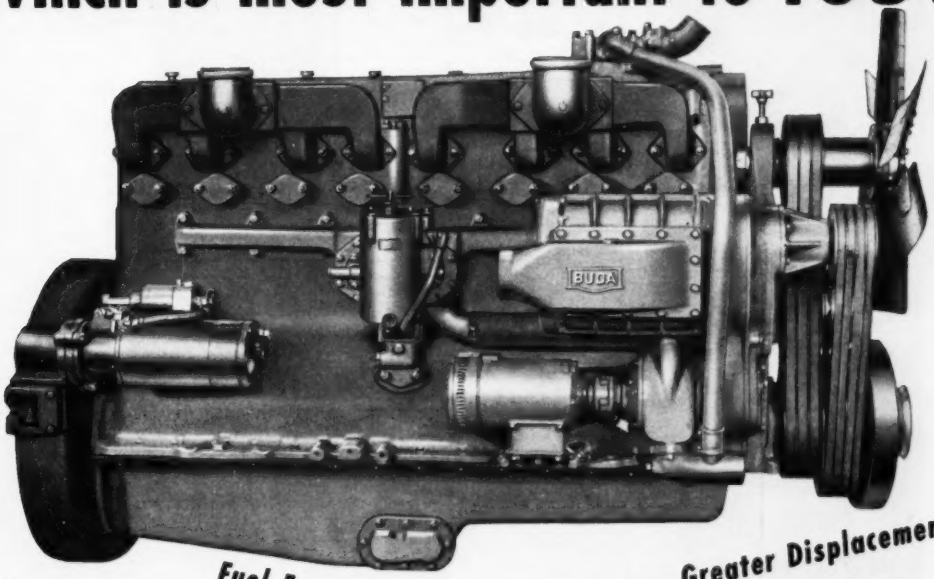

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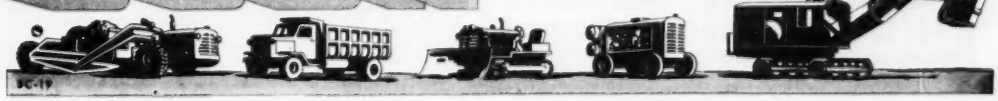
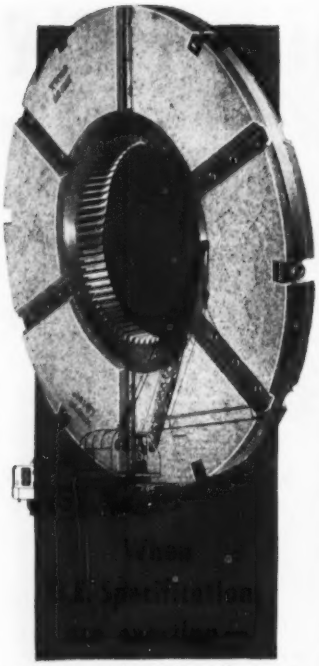


DC-19



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EARTHMOVING . . . Continued from page 88

Fig. 11. Excavator Daily Record For Month of _____ Year _____

Size ____ cu yd. Model _____ Make _____ Attachment Used _____

Owner _____ Job Address _____

Engine hour meter start _____ Fuel _____ Net hours for month _____

Date	Shift hours worked 1st	2nd	3rd	Gal fuel added	Lube oil added, Qt	Lost production time: Excavator Repairs	Other causes	Date	REPAIR AND MAINTENANCE RECORD Description of repair work (List all material used and names of outside helpers or mechanics on repairs)	Outside repair labor	Repair material cost
1											
2											
3											
30											
31											
Total									Operators	Oilers	Total

Est. cu yd per month _____ 1st _____ 1st _____

Total shift hours _____

Less total lost hours _____ 2nd _____ 2nd _____

Net operating hours _____ 3rd _____ 3rd _____

Fig. 12. Excavator Monthly Cost Summary

Excavator Size _____ cu yd. Model _____ Make _____

Variable Machine Costs: (Include operator and oiler time for repairs, but not other lost time)	January Labor Cost	January Mtl. Cost	February Labor Cost	February Mtl. Cost	March Labor Cost	March Mtl. Cost	November Labor Cost	November Mtl. Cost	December Labor Cost	December Mtl. Cost	Total for Year Labor Cost	Total for Year Material Cost
Engine maintenance												
Digger or bucket maintenance												
Pine rigs												
Carriage and gear oil												
Crawlers												
Clutch and brake linings												
Miscellaneous repairs												
Sub Total												
Total labor and mtl.												
Fuel:	Gal	Cost	Gal	Cost	Gal	Cost	Gal	Cost	Gal	Cost	Gal	Cost
Engine fuel												
Lube oil												
Fuel %												
Lube % (per cent for below)												
Total fuel and oil												
Operating Labor and overhead	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost
Operators: less time for repairs shown above												
Oilers												
Social Security												
Workmen's Compensation												
Unemployment Insurance												
Office overhead												
Supervision												
Total												
Total cost per month (Not including fixed costs such as depreciation, taxes, etc.)	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost	Hr	Cost
Net operating hours												
Cost per net hour												
Cubic yard per net hour												
Cost per cubic yard												

lar to that shown in *Fig. 11* furnished the operator each month. Most operators are competent to spend 1 to 3 min at the end of their shift to record the happenings of the day which concern operating cost. This should be a part of their job.

The daily log chart shown in *Fig. 11* really consists of two parts. The left side of the report requires a short entry each shift. The right side requires an entry only when repairs are made.

The Monthly Summary Sheet is shown in *Fig. 12*. This is a bookkeeper's work sheet for totaling and recording each month's operation so that an accurate analysis can be made at the end of the year of the various operating costs. The owner or superintendent then can pick out conditions leading to high costs.

The bookkeeper shows monthly totals taken from the Daily Summary and summarizes machine maintenance costs, breaking them down by the classifications shown, if possible. He also summarizes fuel costs and operating labor costs. Variable machine costs include the operator's and oiler's time spent on

(Continued on page 92)

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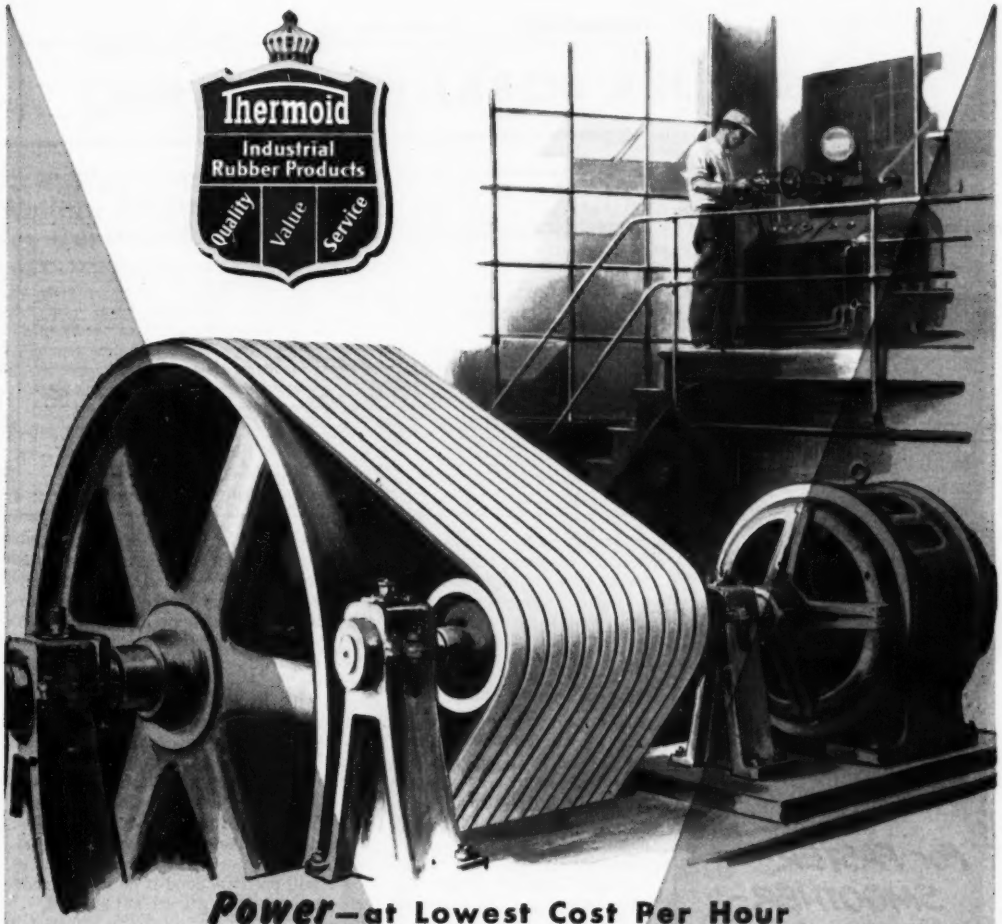

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EARTHMOVING . . . Continued from page 90

Fig. 13. Annual Cost Analysis

Size _____ cu yd; Model _____; Make _____; Serial No. _____

Original cost _____ on _____ 19__; Freight on original _____; Total cost _____

Extra attachments purchased and price: _____ $ _____; _____ $ _____; _____ $ _____; _____ $ _____

Date attachments purchased: _____; _____; _____

To be depreciated at _____ years at $ _____ per year

	1st Year 19__	2nd Year 19__	3rd Year 19__	4th Year 19__
Machine net book value after depreciation				
Fixed costs:				
Depreciation				
Interest on average investment				
Property tax				
Insurance				
Storage rental				
Miscellaneous fixed costs				
Sub total fixed costs				
Total yearly variable machine costs				
Moving and freight costs				
Total yearly fuel and lube oil				
Total cost per year (including fixed costs)				

Yearly operating summary	Net Hours	Hours	Cu Yd	Hours	Cu Yd	Hours	Cu Yd	Hours	Cu Yd
Working on shovel									
" hoe									
" dragline									
" clamshell									
" crane									
" magnet									
Total net hours and cu yd									
Cost per net operating hour									
Cost per cubic yard									

repairs in each of the machine cost items. But then, under Operating Labor and Overhead, these repair hours and costs should be deducted from the operator's and oiler's time shown under Operating Labor, so that this part of operator's time does not appear twice in the total.

Net operating hours are obtained from the Daily Record Sheet. It is possible to arrive at a cost per net operating hour and also possibly a cost per cubic yard if the monthly yardage can be estimated. This cost per yard shows only the month-to-month "out of pocket" costs and does not include the fixed costs of owning the machine, such as depreciation, interest on investment, property tax and insurance.

Fig. 13 shows the final summary for the year, including fixed costs. Fixed costs cannot be allocated to each month's operation because usually it is not known in advance how many hours the machine will operate during the year. The annual cost analysis should include data covering the original cost, plus any attachments added to the machine.

There is space for several years of operating and also space for recording purchases of major attachments for the machine. This sheet should be most valuable as a basis for estimating future job or contract bid prices.

In addition to these cost summaries, many contractors will have the usual repair record cards for each piece of equipment on which parts purchased are listed.

After a few months of record-keeping, the superintendent can determine which machines need to be repaired or replaced, or whether an engine needs overhauling, or if an operator is breaking too much wire rope, or which type of tooth repointing is least costly—and so on.

The foreman and superintendent must make frequent inspections of the log sheet inside the excavator cab to see that each operator is making his entries promptly and correctly before he forgets them. This record should pay extra dividends in keeping the operator just a little more cost conscious, but it will do little good if he knows that recorded results are not studied.

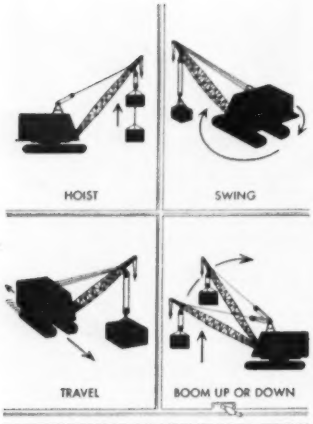
• • •

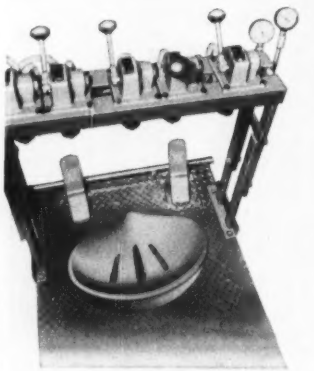
Ed. Note: The eighteenth article in this series will appear in the June issue.

Just a Case of Poor Rolling (by the Editors)

The Galion Iron Works & Manufacturing Co. calls attention to errors in the captions under two pictures at the top of pages 86 and 87 in the March issue of CM&E.

The roller shown on page 86 is a Galion trench roller. (Incidentally, Galion engineers tell us they originated the trench-type roller.) The machine featured on page 87 is a 10-ton Galion Chief with Roll-A-Plane attachment. The three-wheel roller shown in the second picture on page 87 also is a Galion.





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On-the-Job
CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

New Wage and Welfare Policies for Construction

CONTRACTORS preparing to renew existing collective agreements with the building trades unions should know the latest rules covering wages and welfare benefits recently adopted by the Construction Industry Stabilization Commission.

Wages

The formula, approved by WSB March 13, provides that, generally CISC will approve wage increases up to 15c per hr above the 10% increase allowable under the old formula. The latter had permitted increases up to 10% above area rates in effect for particular classifications on July 1, 1950. Included in the additional 15c per hr rise now permitted are such fringe benefits as paid holidays, paid vacations, pensions and other similar benefits. Health and welfare plans (see below) are not included, however.

The new policy is covered by a recently adopted resolution that explains how CISC will act. On wages, the Commission will:

(a) Continue to approve increases in area rates up to not more than 10% of the rates in effect July 1, 1950;

(b) Approve up to 15c per hr above that 10%, unless such an increase would clearly be unstabilizing;

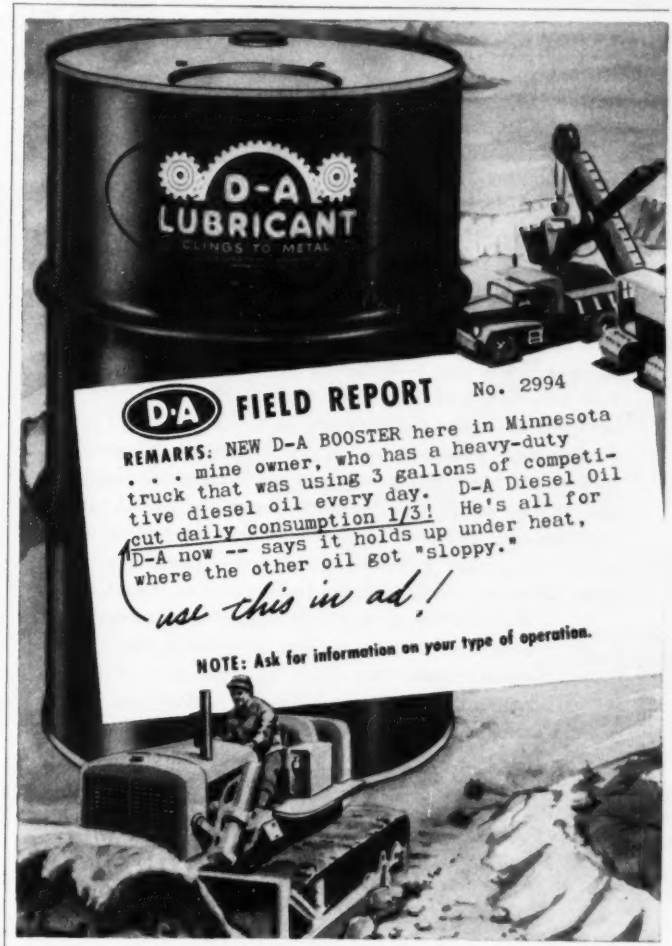
(c) Handle emergency or inequity cases that may request rates higher than permitted under (a) and (b) above on a case-by-case basis as at present, subject to formal WSB approval.

Remember that in all circumstances your request must be on CISC Form 1. To avoid any misinterpretation or delay, be sure to fill in the form completely and indicate the effective date of new wage rates. Under the old 10% formula, CISC would approve any retroactive date requested, provided it did not precede the expiration date of the collective agreement. Now CISC, in acting under the 15c formula, will grant retroactive increases back only to Feb. 1, 1952—but not even to that date if it precedes the expiration date of the agreement being renewed.

Caution: No increases should be paid, even if within the 10% plus 15c formula, until approved by CISC.

Health and Welfare Plans

A new policy covering health and welfare plans now is effective for the industry. It was adopted by a majority of the CISC (two general contractors' repre-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sentatives dissenting) and approved by a majority of the Wage Stabilization Board (all industry representatives dissenting).

CISC criterion for approval of such plans is detailed in their Regulation No. 2. To obtain approval, plans must be limited to an employer contribution of not more than 7½c per hr to include health and welfare funds limited to the payment of temporary disability benefits, hospital, medical and surgical expenses, term life insurance and accidental death and dismemberment benefits.

If you agree in collective bargaining to establish any one or a combination of the above benefits, be sure to get CISC approval before starting to contribute to the fund. For this you have to use the Commission's new Form 2 which can be obtained from the Commission headquarters in the Department of Labor Building, Washington 25, D. C. You can get at the same time a copy of Regulation No. 2 which details the limits of approvable benefits.

Note that contributions to these plans are not included in the 15c per hr wage increase, so that the possible total increase that may be given in 1952 is 22½c per hr.

Again Wage Enforcement

No matter how you slice them, wage violation penalties hurt. Although a 20-p decision by WSB's National Enforcement Commission has reduced the penalties assessed by its Regional Enforcement Commission in Detroit against the J. D. Hedin Construction Co. for violating wage stabilization regulations, it still levied what amounts to a fine of more than $37,000 against the company by disallowing that amount as a tax deduction.

The regional commission had ruled that the company, in paying bricklayers over the legal rate, should be disallowed $40,000 for income tax purposes for 1951 and that the VA should deduct $40,000 in reimbursements to the company for construction of the hospital at Ann Arbor, Mich. The National Commission eliminated, without comment, that portion of the regional commission's decision calling for a $40,000 cut in the reimbursement due the Hedin Co. from the VA.

But it did assess a $37,783.91

(Continued on page 96)

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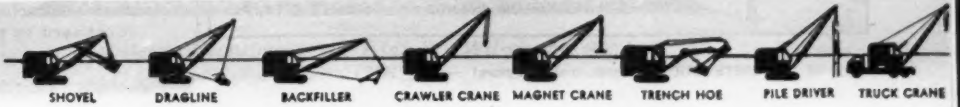

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LABOR . . . Cont. from p. 94

tax disallowance. This was calculated on the basis of $4,056.41 excess wage payments over the legal rate of $2.75, plus $33,727.50 as representing one-half the entire amount paid to bricklayers during the period July 26, 1951 (when specific regulations tailored to the construction industry were issued by CISC) to Nov. 14, 1951 (the date the firm came into compliance).

By passing over that part of the regional commission's decision concerning the VA, the National Commission has neatly sidestepped the legal question of a government agency's authority to direct a contracting agency to withhold reimbursement to lump-sum contractors—a question the National War Labor Board carefully avoided during World War II.

Although fully supporting the regional commission in holding that the firm had violated wage regulations, the National Commission's decision took note of the confusion between the wage freeze date of January 1951 and July 16, 1951, when CISC issued its Regulation 1.

Thus, it penalized the firm only for the illegal payments during that period, but expressed the belief that there was no excuse for further violations subsequent to July 26 and levied sanctions equal to 50% of the total bricklayers payroll from July 26 to November 14.

The construction company can, if it chooses, appeal the decision to the Federal courts, but only on points of law. It has not been indicated whether this will be done.

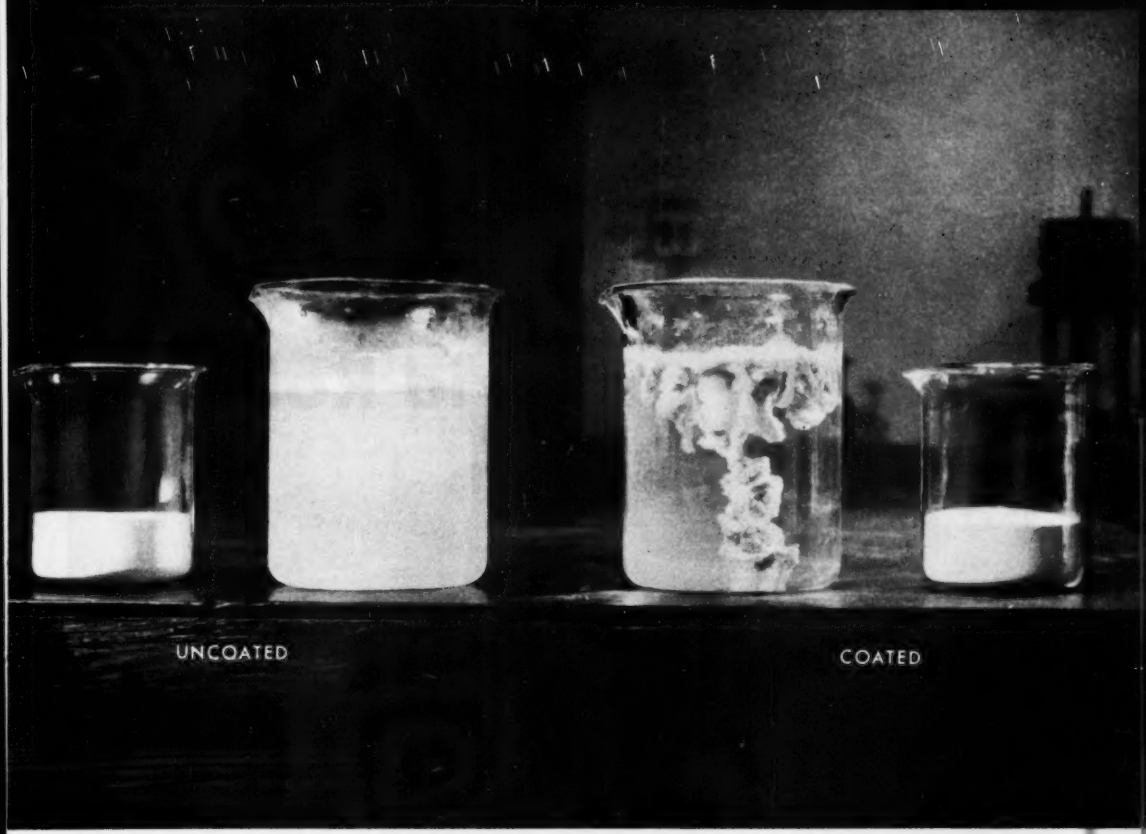
Others Bitten

Other contractors, meanwhile, have felt the bite for violation of wage regulations. Two contractors in a joint venture were disallowed more than $1,000 for tax purposes for paying carpenters over the legal rate. The regional enforcement commission took this action, even though it recognized that the contractors had been unable to recruit carpenters locally and were forced to bring them in from another area where the legal rate was higher and had to pay them the higher rate. Inasmuch as payment of the higher rate was a clear-cut violation of CISC Regulation 1, the contractors consented to the commission's disallowance without further appeal.

Another contractor was disal-

(Continued on page 99)

PROGRESS IN EXPLOSIVES . . .



WHICH BEAKER HAD THE BANG?

The small beaker (left) contains ammonium nitrate. This is an important explosives ingredient, but it absorbs moisture readily. Notice in the large beaker (left)—how it dissolves immediately in water.

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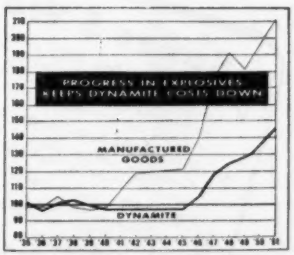

Chart shows relative stability of dynamite prices since 1935, as compared with prices of other manufactured goods. 1935-39 values=100.

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On this black top salvage job in California, Hyster Grid Roller and Caterpillar Motor Grader did in 10 HOURS what it would have taken 7 or 8 DAYS to do with old methods.

Saves 5 Ways

✓ **TIME** — The Grid Roller pulverizes old surface material, compacts road base and new surface courses faster and better than old-style methods and equipment.

✓ **MATERIAL** — On normal salvage, the Grid Roller provides sufficient mix from old material for laying down new surface.

✓ **BINDER** — Usable binder in salvaged material is exposed, thus often reducing new oil required from ¾ to ⅜ gal. per sq. yd.

✓ **EQUIPMENT** — The Grid Roller does triple duty — reclaims old mat, compacts base, rolls new surface courses.

✓ **LABOR** — One operator performs simultaneously the pulverizing and scarifying or blading operations. Faster road reclaiming also means less labor time on the job.

BITUMINOUS ROAD SALVAGE has been revolutionized by the Hyster Grid Roller. Now it is **economically possible** to salvage, rejuvenate and use the old, worn-out surface material for re-laying the new road surface.

The procedure: (1) SCARIFY or rip up the worn surface; (2) PULVERIZE—Grid Roller reduces chunks to original loose road mix; (3) PREPARE BASE — compact with the Grid Roller; (4) LAY DOWN new surface, using salvaged road mix material, and rolling out with Grid Roller; (5) TURN OVER TO TRAFFIC.

From coast to coast CITY, COUNTY, STATE, FEDERAL and PRIVATE ROADS are being reclaimed at great savings in time, oil, material, labor and equipment. The nature of the job determines whether the Grid Roller should be towed by a motor grader or tractor.

See your Caterpillar-Hyster dealer. Write for literature.

HYSTER COMPANY

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LABOR . . . Cont. from p. 96

lowed over $2,700 because he paid double time for overtime when the local collective agreement and area practice provided for only time and one-half. This too is a violation of CISC Regulation 1.

In still another case, a contractor was disallowed for tax purposes over $3,000 because he did not file with WSB wage and salary schedules for a new construction project in an area where he had not worked before and where he was paying higher than local wages and salaries. Although CISC regulations do not require that wages to be paid building trades employees be reported, WSB Regulation No. 9 does require reporting of wages and salaries to be paid non-manual administrative employees prior to the start of work.

Complaints have been filed by the Regional Wage Stabilization Board in Cleveland against some 150 building contractors in Ohio and Kentucky, charging payments of illegal rates to bricklayers and roofers. Regional WSB officials say this enforcement action is only the beginning!

Do You Know That:

Under a recent interpretation, WSB has ruled that the Construction Industry Stabilization Commission has jurisdiction over laborers and mechanics employed at the site of work even though (a) organized by an industrial union rather than by the AF of L building trades, and (b) their employer's main business is not construction?

The Office of Salary Stabilization has issued procedural regulations on how to file applications for adjustment of salaries and other compensation of executives, administrative and professional employees? Applications have to be on OSS Form 300. Forms, together with assistance in filling them out, can be obtained from the nearest Regional Wage-Hour Division office.

Salary Stabilization Board investigators are inspecting hiring and pay practices of engineer-contracting firms in Boston, Baltimore, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Los Angeles, New York, Philadelphia, St. Louis and San Francisco? Questionnaires also are being sent to other firms throughout the U. S. inquiring into their practices dating back to 1950.

Simplify Set-Up in PRESTRESSING CONCRETE with SIMPLEX Re-Mo-Trol

Hydraulic Pumps and Remote Controlled Rams

Prestressing of concrete block structure with pair of Re-Mo-Trol Rams and one pump.
Stock Rams have up to 3⅛" CENTER-HOLE. Though prestressing is comparatively new we have in stock chairs and pull-rods adapted for handling strands from .600" to one-inch diameter.

The Simplex Re-Mo-Trol with the Center-Hole Ram eliminates need for complicated rigging in prestressing of concrete — saves time, cuts costs. Single rods or strands pass through the Center-Hole Ram for fast set-up and smooth, even operation. Double-strand pulls are made with two Rams operated from a single pump . . . no need for heavy, clumsy yokes. Pressure gauge on pump gives accurate stress control. Two Pumps with solid or center hole rams are available in models 10 to 100 ton capacities.

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Speedy . . . Safe . . . Versatile . . . for All Construction Operations

SIMPLEX Ratchet Lowering Lever Jacks

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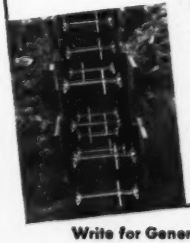

SIMPLEX Trench Braces

Protect Against Cave-ins. Steel drop forgings, with ball and socket joints at ends for quick adjustment and tight grip. Adjustable to any width trench. Available with or without pipe.

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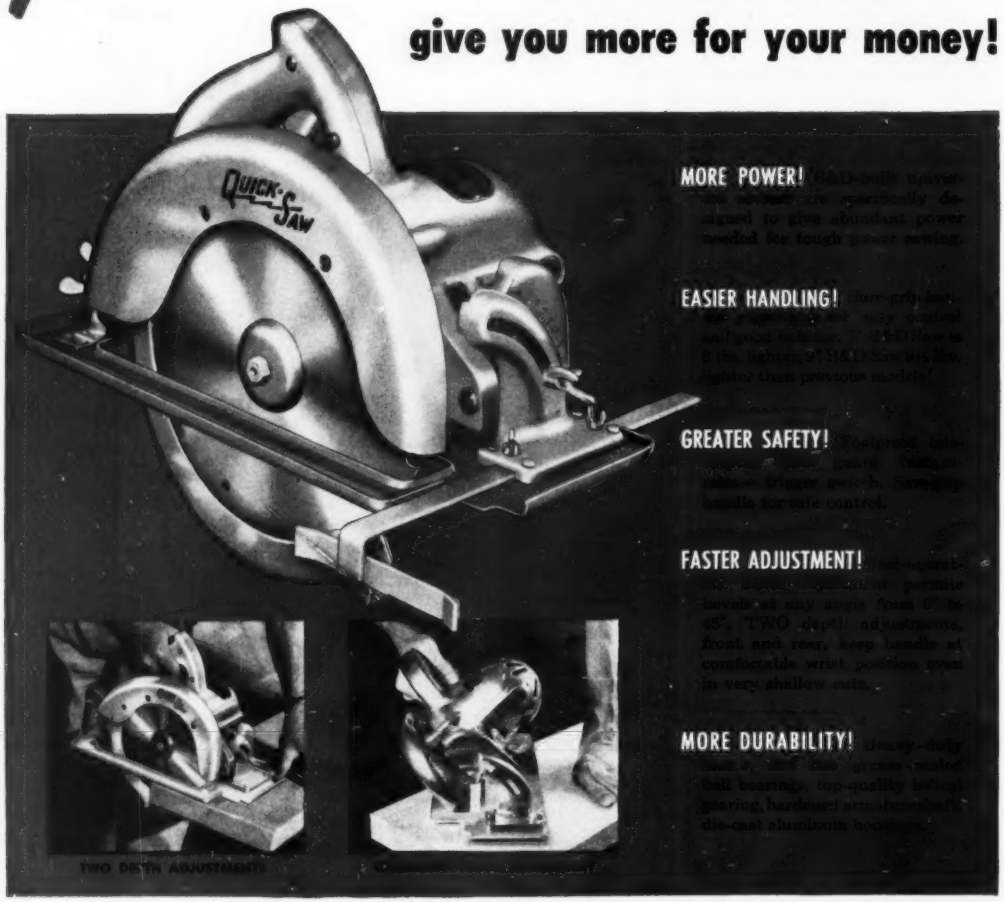

SEE YOUR NEARBY B&D DISTRIBUTOR for a demonstration of the 9" B&D Saw (shown), $117.00, cuts to 3¼" depth; or the 7" B&D Saw, $88.50, cuts to 2⁷⁄₁₆" depth.

And remember: he's a good man to contact whenever you have a tooling problem, because of his years of experience with many construction jobs and many construction problems!

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Digging away so merrily is the dragline conversion of...

Harnischfeger's 55 Miti-Mite

... A New Idea in Small Truck Cranes

By HAROLD W. RICHARDSON, Editor

SIMPLICITY OF DESIGN and operation makes Harnischfeger's new Model 55 especially adaptable to backhoe operations. With this equipment it's a fast little rig, too.

IT'S ORTHODOX in that it is full revolving and fully convertible to crane, dragline, shovel or backhoe. Beyond that, the new P&H Model 55 (affectionately dubbed the Miti-Mite) 7-ton, truck-mounted rig takes off into a dream world of design advance and simplicity.

Harnischfeger, long successful in building heavy excavating machinery, is entering the small truck crane field for the first time. The company was determined to bring out something new and different —not just a small prototype of its larger machines and not just another truck crane.

The job was assigned to Frank (Crane Man) Edwards, sales manager, Small Excavator Division, and chief designer W. J. Perkins. And they turned out a sweet little rig that is a marvel of simplicity. For want of a better designation, they call it an automotive design— but that's an inadequate and vague description of it. The machines can

GOOSE NECK BOOM on Model 55 backhoe lets it dig way down under, practically beneath truck rear wheels. Outriggers shown here are handy for heavy crane work.

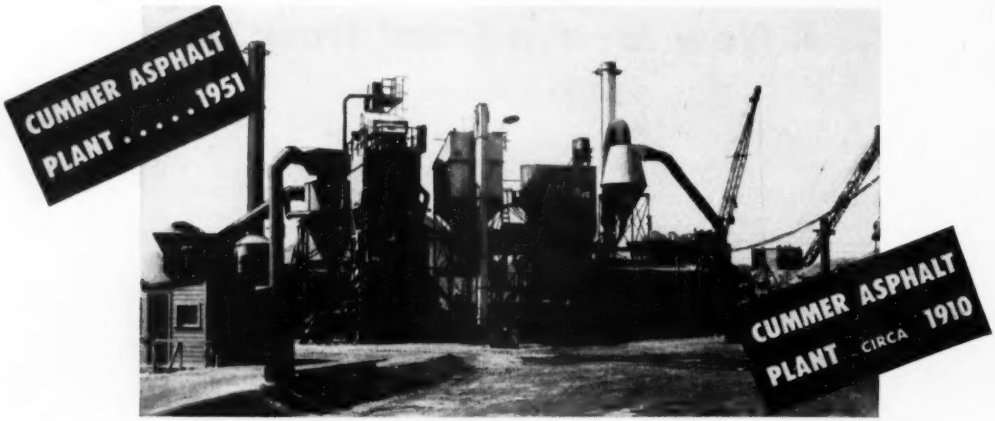
be mounted on any standard truck with suitable axle load capacities.

None of the conventional bed frame, bed castings, or side stands for drums are found on the Miti-Mite. All these have been replaced by a simple, rugged power box around which the machine is built —key to the whole design.

The whole upper revolving frame is simply a narrow vertical box welded to a wide base plate. Behind the box are two flaring vertical wings acting as stiffeners of the rear frame extension that carries the engine and counterweights. This entire assembly is 1-in. solid steel plate, all welded into a stiff, rugged unit.

To the power box and bed plate assembly is fastened every element of the upper revolving unit. Engine and counterweights become a part of the composite frame; the boom is on the front upper roller track, bearing rollers and hook rollers are all welded to the bottom; the gantry frame takes off from the top; the cab is fastened to sides and backs; and all gearing and upper drive mechanism is sealed in oil inside the box.

Power drums, with their hydrau-



"Twin plants . . . We call them Grandpa and Son . . ."

In such words does Harold Thompson of Cooke Contracting Co. describe their efficient, profit making twin plant set-up at Centerline, Michigan. Daily, these two Cummer Plants turn out peak production that more than meets the rigid state specifications. The new plant has a capacity of 1,000 tons a day.

The 40 year old Cummer Plant has a 500 tons per day capacity . . . one ton mixer . . . belt and sprocket driven . . . vibrating screen has been added. Notice common dust bin. This is positive proof that Cummer Asphalt Plants give you continuous, high, efficient production. Write for catalog.

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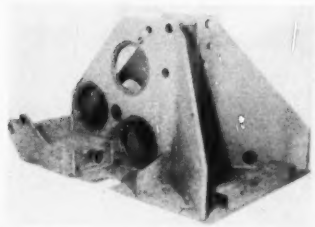
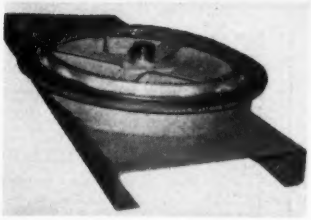




THREE BASIC ASSEMBLIES for the P&H Miti-Mite: Top—All-welded power box built up in jigs from 1-in. steel plate; holes are bored with special new tools. Center—To this power box is welded a frame extension to the rear that carries the engine and counterweight boxes. Bottom—Lower non-revolving frame is simple channeled bed plate for fastening to truck frame, surmounted by swing circle, swing ring gear and stub center pin, all welded into one unit.

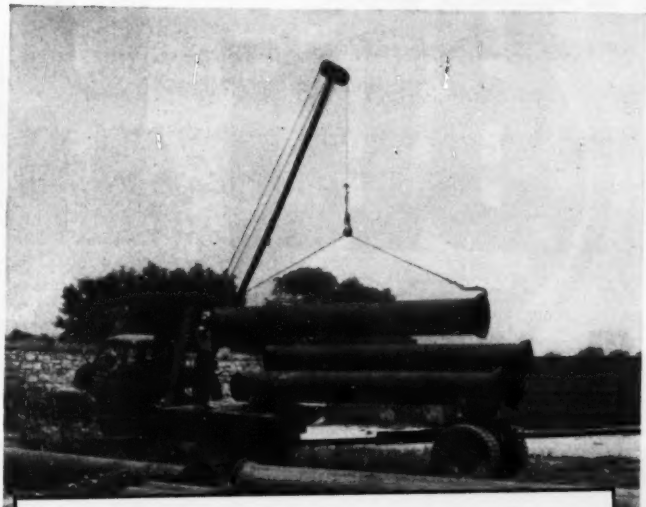
lic-operated clutches and brakes, are outside of the sealed enclosure, on shafts extending through the sides of the box turning on sealed roller bearings.

Sealed-in Power Train

Here's how the power train sets up: A 6-cyl Chrysler 50-hp gas engine (with electric starter) drives through a four-speed transmission and universal joint to a longitudinal shaft through the rear of the power box. This shaft ends within the box in a worm gear that drives a main transverse shaft carrying the boom hoist on one end, and the shovel retract drum on the other end.

Within the box this same shaft mounts two chain sprockets. These,

(Continued on page 106)



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The new Pitman Hydra-Lift comes ready to install on the frame of any truck, 1½ tons or larger. Hydraulic power swings boom 180 degrees, lifts boom 100 degrees. Boom telescopes from 12 to 22 feet. Lifting capacity is 6,400 pounds; requires only 40 inches behind the truck cab, leaving bed free for normal purposes. Write today for complete information on new Pitman Hydra-Lift!

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Texas Construction Company	Dallas, Texas
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Vacellio and Grogan	Beckley, West Virginia
Vinnell United Bell Company	Trenton, Nebraska
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Wester Construction Co.	Buggs Island, North Carolina
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Wright, John D.	Talco, Texas
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B & M Coal Co.	Weedville, Pennsylvania
Bolling Construction Co.	Pound, Virginia
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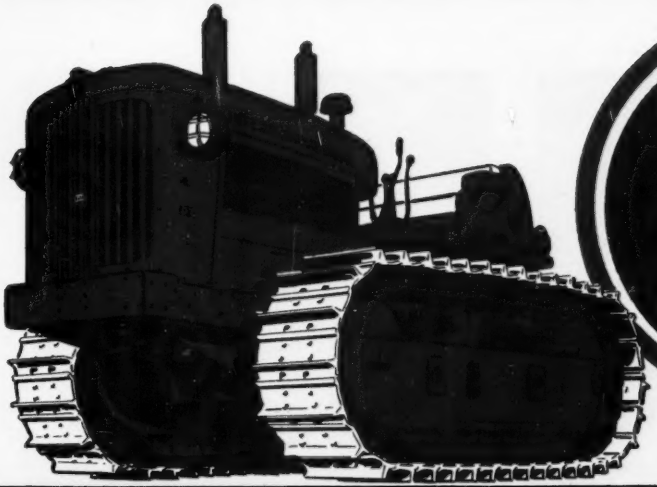

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Hanna Coal Co.	Adena, Ohio
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Pickands Mather Co.	Hibbing, Minnesota
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Usibelli Coal Mines	Healy River, Alaska
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Hammond Lumber Co.	Trinidad, California
Hines Lumber Co.	Westfir, Oregon
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Long-Bell Lumber Co.	Vaughn, Oregon
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McNutt Bros. Construction Co.	Eugene, Oregon
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Rasor Logging Co.	Eugene, Oregon
Rayonier, Inc.	Sapho, Washington
Russell & Sons, V. R.	Valsetz, Oregon
Russell & Gillette	Cle Elum, Washington
Schuler Construction Co., J. F.	Robbinsville, North Carolina
Siuslaw Forest Products Co.	Mapleton, Oregon
Smith Lumber Co., Ralph L.	Anderson, California
Smith, Ralph	Tillamook, Oregon
Snoqualmie Falls Lumber Co.	Snoqualmie Falls, Washington
Stoddard, Roy	Fort Bragg, California
Sweet Brothers Lumber Co.	Eugene, Oregon
Ulrich, William	Spokane, Washington
Union Lumber Co.	Fort Bragg, California
Vosbury & White	Alsea, Oregon
Westside Lumber Co.	Tuolumne, California
Wyerhaeuser Timber Co.	Tacoma, Washington
White River Lumber Co.	Enumclaw, Washington
Willamette Valley Lumber Co.	Dallas, Oregon
Woolley, Harold	Drain, Oregon

PIPELINE

NAME	
Anderson Brothers	Houston, Texas
Anderson Construction Co.	Salem, Illinois
Associated Pipe Line Corp.	Houston, Texas
Bechtel Corp.	San Francisco, California
Bishop and Lock	Dallas, Texas
Britton Contracting Co.	Washington, Pennsylvania
Burden Construction Co., O. R.	Wichita Falls, Texas

PIPELINE

NAME	
Fulton, R. H.	Lubbock, Texas
El Paso Natural Gas Co.	El Paso, Texas
Gentry Construction Co., H. L.	Jackson, Mich.
Mahoney Contracting Co.	Lansing, Michigan
Midwestern Constructors	Tulsa, Oklahoma
Morrison Construction Co.	Austin, Texas
Oklahoma Construction Co.	Dallas, Texas
Price Company, H. C.	Bartlesville, Okla.
Saigh Company, N. A.	Campbellsville, Kentucky
Smith Contracting Co.	Ft. Worth, Texas
Smith Contractor Corp.	Allavista, Virginia
Texas-Louisiana M. K.	Ft. Worth, Texas

MISCELLANEOUS

NAME	
Alaska Road Commission	Alaska
Baltimore, City of	Baltimore, Maryland
Bethlehem Steel Co.	Bethlehem & Steelton, Pa.
Commonwealth Edison Co.	Chicago, Illinois
Consumers Power Co.	Jackson, Michigan
Dane County Highway Dept.	Madison, Wisconsin
DuPont, E. I. deNemours & Co., Inc.	Wilmington, Delaware
Duquesne Light Co.	Pittsburgh, Pennsylvania
Kohaha Sugar Co., Ltd.	Kohaha, Kauai, T. H.
Lone Star Steel Co.	Lone Star, Texas
Niagara Mohawk Power Corp.	Albany, New York
Northern Indiana Public Service Co.	Gary, Indiana
Public Service Co., No. Illinois	Chicago, Illinois
Sheboygan County Highway Dept.	Sheboygan, Wisconsin
Tennessee Coal and Iron Co.	Fairfield, Alabama
Tennessee Valley Authority	Knoxville & Chattanooga, Tennessee
U. S. Atomic Energy Commission	Oak Ridge, Tennessee
U. S. Engineers	Tulsa, Oklahoma
W. Virginia State Road Commission	Charleston, West Virginia

CANADIAN CONTRACTORS

NAME	
Iron Ore Company of Canada, Ltd.	Montreal
Bell Asbestos Corp.	Asbestos, Quebec
Fraser Brace Ltd.	Montreal
Shawinigan Power, Ltd.	Montreal
McFarland Construction Co., Ltd.	Picton, Ontario
Ontario Hydro Electric Commission	Toronto
Peel Construction Ltd.	Brampton, Ontario
Carter Construction Ltd.	Toronto, Ontario
Wasson Coal Stripping	Minto, N. B.
Sten Peterson	Winnipeg, Manitoba
Bird Construction Ltd.	Regina, Saskatchewan
Morrison-Knudson (Canada) Ltd.	Vancouver, B. C.
Alaska Pine Ltd.	Vancouver, B. C.
Steeprock Iron Mines Ltd.	Steeprock, Ontario
Aluminum Co. of Canada	Montreal, Quebec
Celanese Corp. Ltd., of Canada	

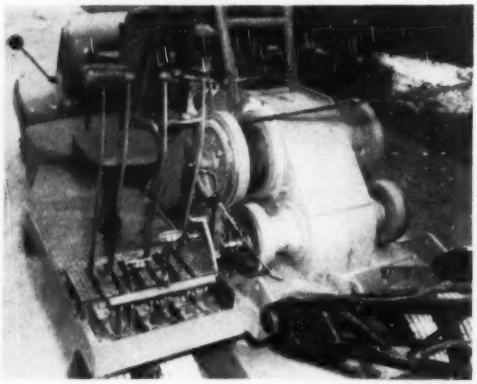
The list of TD-24 fleet owners is growing every day, as is the vastly longer list of owners of single TD-24 tractors. For this reason the above list is not complete. If you're a TD-24 fleet owner whose name is missing, we'll catch you next time.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

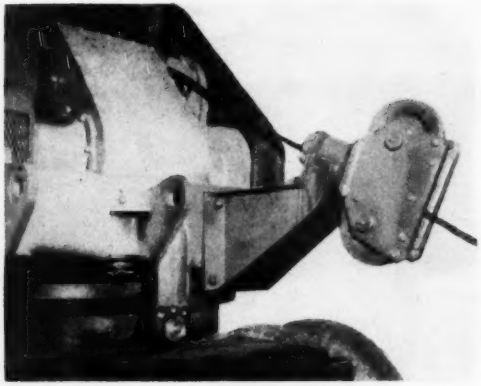
INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS



FRONT END VIEW, with cab removed, shows compact, yet roomy, control assembly at left. Note how widespread boom is fastened to base of power box. Lower front drums are swing clutches and brakes; lower center drum on this side is for live boom hoist; above



it is main load-line drum. FAIRLEADS (above) fasten to front of power box at left side. Upper drum in left side handles drag line, closing line or shovel crowd drive. Note how hook rollers and bearing rollers are attached to bottom of box.

in turn, chain-drive two more shafts, one carrying the hoist and digging drums, the other mounting two bevel gears for the swing mechanism.

All shafts are supported by roller bearings whose shoulders, fitting snugly into bored holes in the box plates, support the load. The two chains running through an oil bath at bottom of box, carry and splash oil to the entire internal power train. Seals at the outside bearings are oil tight. But, just in case a leak should develop, the oil would pass into the interior of the drum, thence through a hole to the wrapped cable as additional rope lubrication.

Because of the universal joint between engine and worm gear drive, maintenance of engine alignment is no problem.

Internal clutch shoes and external band brakes, both operated hydraulically, are at the outside end of the drums for easy access. The two swinging drums are finned for air cooling. All hoist drums are

(Continued from page 110)

STANG DRIES 8000′ TUNNEL EXCAVATION

17′ BELOW GROUND WATER LEVEL

The City of Long Beach, California, constructed an outfall sewer 8000′ long to relieve a congested sewerage system. Tunnel bore was excavated in soft ground from shafts 40 feet deep, ground water level averaging 2 to 3 feet above tunnel roof. Invert was 10′ below ground water level and pits were dewatered up to 7′ below invert. Stang wellpoints were installed along a header line in tunnel to pump 17′ of water. A Stang electric pump, located above tunnel roof over portal of each section, operated the header line in shaft as well as in tunnel. Result—dry ground all through the tunnel, right up to the heading.

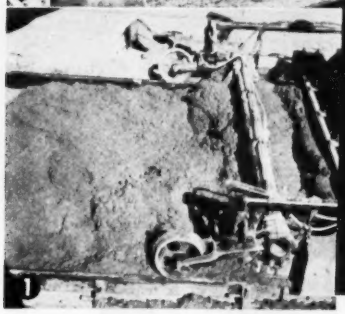
JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment

8221 Atlantic Avenue, BELL, CALIF. Tel: Walnut 7796

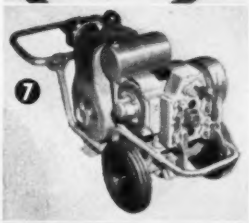
2123 S. 56th St., OMAHA, NEBRASKA

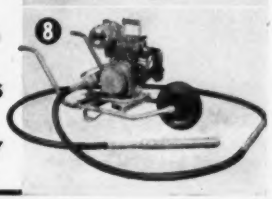
NEW YORK CITY 4, NEW YORK



JACKSON VIBRATORS

THE BEST FOR ALL CONSTRUCTION





1 **VIBRATORY PAVING TUBE** which is quickly attached to any standard finisher, provides full width internal vibration through full depth of the slab. The harsher mixes are readily made plastic, saving cement and time, or with no cement reduction, greater compressive strength can be achieved. Quickly adjustable from 10′ to 25′.

2 **SIDE FORM VIBRATOR:** Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator. Saves better part of two men's labor. Will not penetrate through concrete to subgrade.

3 **ELECTRIC VIBRATORY SCREED** with Jackson Portable Power Plant: A great producer on MUNICIPAL PAVING, BRIDGE DECKS, HIGHWAY WIDENING and PATCHING. Strikes off to all crowns, undercuts at curb or sideform, works right up to and around manholes and other obstructions. Inexpensive.

4 **VIBRATORY COMPACTOR — ASPHALT:** Delivers up to 4500 1¾ ton blows per minute. Propels itself and will compact 900 to 1200 sq. ft. per hour, close to theoretical density of mix used. Highly mobile. Operates on 3-phase 110 V. 60 Cycle AC from Jackson Power Plant on trailer having means of quickly picking up and lowering compactor.

5 **VIBRATORY COMPACTOR — GRANULAR SOILS:** Same as above except for corrugated base. Provides 95 to 100% of maximum density (A.A.S.H.O., T99-38, Cone, Vibratory Table).

6 **FLEXIBLE-SHAFT, ELECTRIC VIBRATOR:** 2½ HP motor. Operates from light socket, 115 V., single phase AC or DC, with any length of shaft up to 28′. 8,000 to 10,000 VPM.

7 **PORTABLE POWER PLANTS:** Three models, 1.25, 2.5, 5 KVA capacities. Generate both single phase and 3-phase 110 V., 60 Cycle AC and are equipped with permanent magnet generators requiring no adjustment or maintenance. For operating all types of vibrators, contractors' tools and lights.

8 **ENGINE-DRIVEN FLEXIBLE-SHAFT VIBRATOR:** The finest in its class, for both thin and thick sections. Unusually powerful (6 HP).

Write — **WIRE OR PHONE for COMPLETE DETAILS**

JACKSON VIBRATORS, Inc.

ELECTRIC TAMPER & EQUIPMENT COMPANY

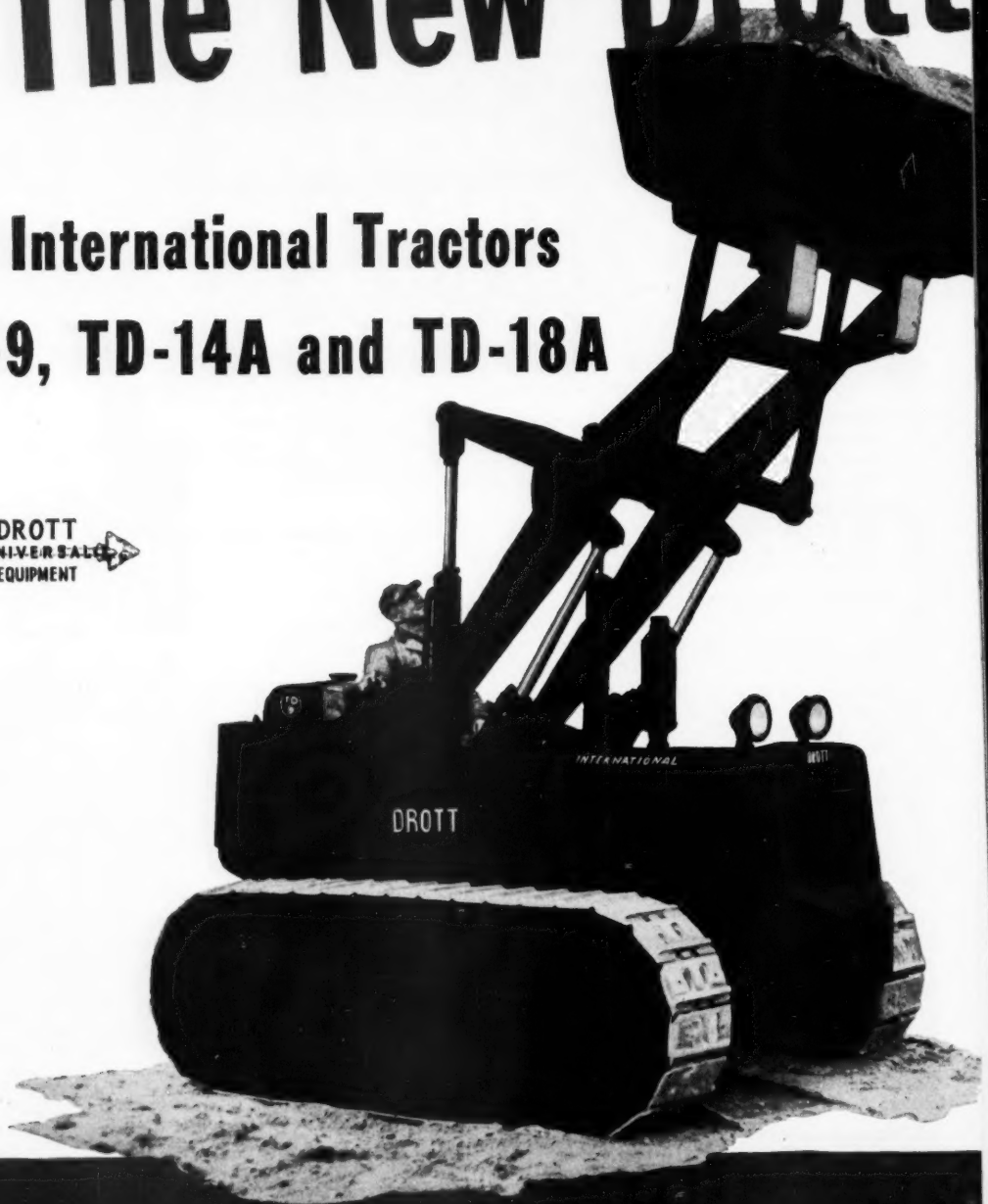
LUDINGTON, MICHIGAN

best loader built!

The New Drott

For International Tractors TD-9, TD-14A and TD-18A

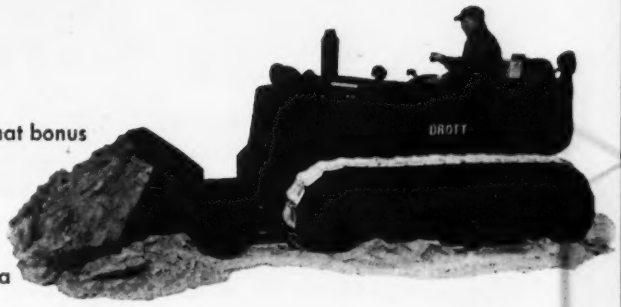
DROTT
UNIVERSAL
EQUIPMENT



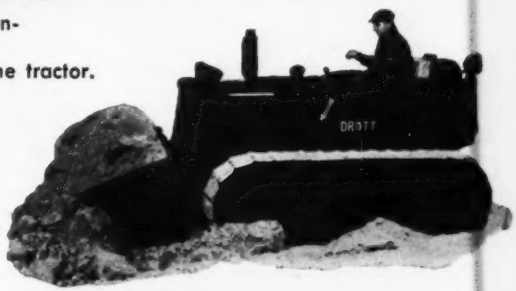
See your International Industrial [illegible] or write to

Skid-Shovel

Here's why . . .

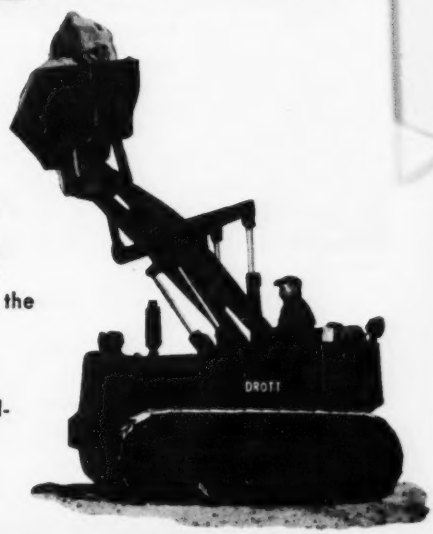


Drott's patented Break-Out Action never lets that bonus yardage slip off the bucket. Break-Out Action tips the bucket back **before** it is lifted from the cut. The load is pried back over the shoes and a heaping bucket is a sure thing at every pass. The tremendous prying force is directed into the ground—not onto the tractor.



The load is transported on the shoes, relieving the tractor of "carry strain" and giving the operator excellent visibility. Shoe Transportation keeps the entire unit in perfect balance.

Another Drott first is the Hydro-Spring, a super shock-absorber that reduces hydraulic shocks by two-thirds. It also absorbs a high percentage of your maintenance costs.



Low Overall Height permits working in confined areas, and when that extra stretch is needed, you'll find that the Drott Skid-Shovel has Higher Lift and Farther Pitch than any other loader in the same capacity range.

Compare these features. You'll find that the New Drott Skid-Shovel is the best loader built.

Manufacturing Corporation • Milwaukee • 3 • Wis.

LEFT-HAND VIEW of exposed machinery reveals how engine and counterweights fasten to rear extension of power box bottom plate, how boom is attached to front, and how gantry reaches out from top. Swing and hook rollers are integral part of upper revolving assembly; circle, swing gears and stub center pin are part of lower bed frame. Shaft without drum is for shovel crowd, working with drum just above it, both fitted with chain sprocket.

TWIN UNIVERSAL JOINTS on main drive shaft make exact engine alignment unnecessary. Four-speed transmission is located between engine and drive shaft. Main drive ends with worm gear inside box.

fitted with rubber-mounted pawls for locking the load. The swing mechanism also has positive locks.

As the result of special engineering study, the cable drums have been neatly tapered to eliminate chafing and to assure the smooth winding that prolongs cable life.

The cab and engine enclosure act as a huge ventilating duct, exhausting through the radiator at rear of engine. Intake ports in sides of cab direct incoming cool air over the drums, clutches and brakes. A reverse fan is available to provide a cab heater for winter.

Details of the rig are shown in accompanying illustrations and the table of specifications.

The lower bed assembly is solid plate steel, bent downward into channels at each edge for easy mounting on any truck frame. Swing circle, stub center pin and internal swing gears are mounted on this bed. Center and rear outriggers are available.

Counterweight boxes on the upper revolving frame are filled with poured concrete, totalling 4,000 lb, after delivery.

We saw Miti-Mite being built at Harnischfeger's new plant at Escanaba, Mich. The simplicity of both design and assembly is amazing. Much special tooling up was required. After the power box is welded up in jigs, shaft holes are bored with elaborate, special and accurate machine tools. That, along with milling the swing circles etc, makes a machine virtually carved out of the solid. Welding machines are the principal assembly tools for the unit frame assemblies.

There she is, pride of the Harnischfeger organization. The P&H 55 Miti-Mite looks like a honey of a rig, with promise of a versatile career.

P&H Model 55 Specifications

SHOVEL:
- Boom: 15 ft, all-welded
- Stick: 12 ft, all-welded, center type
- Bucket: ¾-yd struck cap, three renewable teeth
- Electric bucket trip
- Positive chain crowd and retract mechanism

BACKHOE:
- Boom: 14-ft all-welded goose-neck type
- Stick: 6-ft, all-welded
- Bucket: 30-in. cutting width, integral alloy teeth
- Power-operated auxiliary gantry

MAGNET GENERATOR (if desired):
- 250-v, dc, CPG-12, 5KW
- V-belt drive from crane motor

LOAD LINE PULL:
- Rated 8,000 lb.

CRANE AND DRAGLINE:
- 25-ft angle chord lattice pin bolt boom
- 5- and 10-ft inserts available, with socketed guy cables to match
- Boom stop—telescopic single tube
- Fairlead—2-sheave swivel castor type, bronze bushing
- Rud-O-Matic tag line
- Crane bottom block—7 ton, single sheave for 2- or 3-part line

GENERAL:
- Fully convertible to crane, dragline, shovel and backhoe
- Swing speed—5 rpm
- Independent live boom hoist and shovel retract
- Hydraulic clutches and brakes
- Hydraulic foot-brake ratchets
- Full-vision, single-man cab
- Foam rubber seat and back rest
- All controls conveniently located

ENGINE:
- Chrysler 6-cyl gas, 50 hp @ 1,900 rpm
- Four-speed transmission
- Universal joint drive to power train

CRANE LOAD RATINGS ((Over the Side):

Without Outriggers:
- 10-ft radius—8,000 lb
- 15-ft radius—5,000 lb
- 20-ft radius—3,500 lb
- 25-ft radius—2,500 lb
- 30-ft radius—1,800 lb
- 35-ft radius—1,500 lb

With Outriggers:
- 12-ft radius—14,000 lb
- 15-ft radius—11,000 lb
- 20-ft radius— 7,500 lb
- 25-ft radius— 5,500 lb
- 30-ft radius— 4,150 lb
- 35-ft radius— 3,000 lb

McKIERNAN-TERRY PILE HAMMER

drives 304-ft steel pile

Sets record for Long Pile Driving on Meadville, Pennsylvania relocation job

"We put this 14-in. H pile down 304.3 ft with a McKiernan-Terry S-8 Single-Acting Pile Hammer." That's the statement of L. A. Meyer, superintendent for S. J. Groves & Sons, contractor on this Meadville, Pa. bridge relocation job.

Naturally a powerful McKiernan-Terry Hammer set this impressive pile driving record. With a 26,000 foot-pound blow, the McKiernan-Terry S-8 successfully met varying ground conditions. Piles about 50 ft apart encountered both light and heavy resistance to penetration. Lengths averaged 170 ft with differences of as much as 100 ft between piles next to each other.

On record-making or regular jobs, McKiernan-Terry Hammers always insure profitable pile driving. Complete McKiernan-Terry line includes 16 sizes of hammers and 2 sizes of extractors. Write for bulletin giving full details.

L. A. Meyer, contractor's superintendent, standing alongside the record-depth pile driven by McKiernan-Terry Hammer.

A McKiernan-Terry S-8 Single-Acting Pile Hammer driving long-length steel piles for relocation work on a five-span bridge near Meadville, Pa.

MK 818

McKIERNAN TERRY

OTHER McKIERNAN-TERRY PRODUCTS

MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES
Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

GRAB BUCKETS
Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

HONING UP TO 42-IN. I.D. X 55-FT. LONG
Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 14 PARK ROW, NEW YORK 38, N.Y.

Plants: Harrison, N. J. and Dover, N. J.

Protection by TOUSEY!

THE undercarriage and interior surfaces of this giant crane are protected from the most rigorous abuse by a TOUSEY finish. ★ Close cooperation between the TOUSEY sales representative, the testing laboratory and management makes the formulation of such a finish a matter of routine. A routine that has been developing for 67 years at TOUSEY—offering excellent service to customers —offering extra protection through careful quality control.

TOUSEY PRODUCTS

DURACOTE for DURABILITY

THE TOUSEY VARNISH COMPANY

320 WEST 25TH STREET • CHICAGO 16, ILLINOIS

THE *Maintenance Shop*...

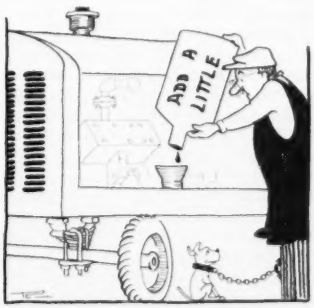
A MONTHLY EQUIPMENT SERVICE AND REPAIR FEATURE

Install Engine Bearings Carefully

By HOMER C. CAMPBELL, Service Manager
H. W. Moore Equipment Co., Denver, Colo.

WE HAVE NEVER SEEN an engine failure due to lubricants. But we have seen many failures caused by mishandling of lubricants.

Included are contamination by dirt, water and the addition of inhibitors, or "stuff," that will (from all tales told) do anything from the tightening of connecting rods to inflating of tires. These patented additives, if not used judiciously, will contribute to engine difficulties and particularly to bearing failures. This statement does not cover all



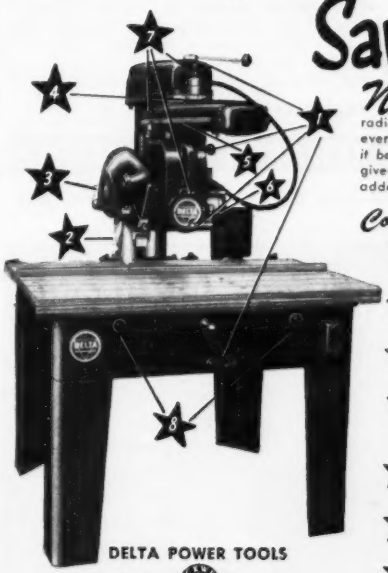
additives. But some have been used indiscriminately, and trouble has resulted.

In all too many cases the failure of main and connecting rod bearings is charged against the lubricant used. A careful follow-through on most of these cases will prove that the party making the charges usually is at fault, rather than the lubricant.

Dirt is the first and most common cause of bearing failures, whether plain, ball or roller types. This discussion will deal solely with plain bearings as used in the modern high-speed diesel engine.

Personnel connected with the handling of lubricants in the maintenance and repair of engines put just about as much dirt into an engine as gets in from other sources, such as leaky gaskets, faulty air filters and dirty fuel and oil filters. Foreign matter gets in its most damaging licks by being circulated through the lubricating system of the engine. It is sent directly to the bearings by the oil pump and starts to cut and chew at the bearing and shaft material just as soon as it is

Delta Again Scoops All Saw Makers



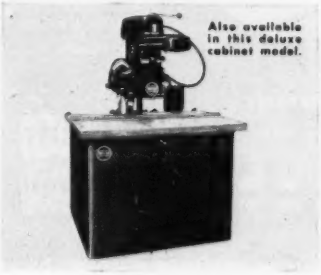
DELTA POWER TOOLS
Another Rockwell Product

There's a Delta Power Tool for Your Job-
WOOD OR METAL WORKING
53 Machines • 246 Models • More than 1300 accessories

New Here at last is a heavy-duty radial saw especially designed to perform every operation you'll encounter—and to do it better. Only this new Delta "Radial" Saw gives you these exclusive features which mean added profits through production economies.

Compare These 8 Features

1. **Only Saw With All Controls In Front** ...safer, easier to operate because every lock, lever, crank and calibrated scale is "up front".
2. **16" Saw Blade Cuts 5⅛" Deep** ... unmatched capacity, more than any other 16" saw blade—blade not only cuts deeper but lasts longer.
3. **One-piece Aluminum Safety Guard** ... covers the entire saw spindle for added safety (can be fitted to enclose blade completely).
4. **Front 360° Miter Pivot** ... permits saw arm to rotate 360° **above** the work table; swings either way, right or left, to cut miters from 0° to 90° with normal "pull saw" action.
5. **Enclosed Life time Trackways** ... glass-smooth, hardened surfaces minimize roller friction; carriage travels more easily, rolls much faster with less effort.
6. **Sensational New "Lo-Rise" Motor** ... powerful direct drive, totally-enclosed, fan-cooled motor furnished in 3, 5, and 7½ HP.
7. **Quick-set Stops at 30°, 45°, 60° and 90°** ... takes but a few seconds to set saw at these commonly used bevel and miter positions.
8. **Front Guide Fence Controls** ... offer quick, positive locking action when changing guide fence positions; no more hammering of wedges.



DELTA MILWAUKEE DELTA POWER TOOL DIVISION
Rockwell MANUFACTURING COMPANY
649E E. Vienna Ave., Milwaukee 1, Wisconsin

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☐ Please send the name of the nearest Delta Dealer.

Name _____ Position _____
Company _____
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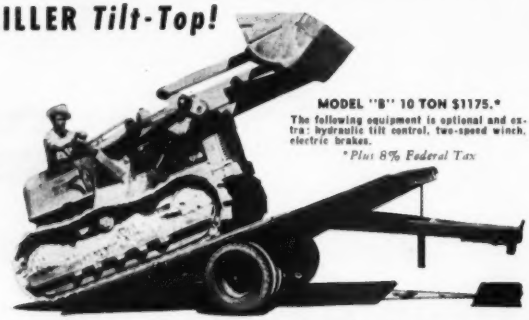
City _____ Zone ____ State _____

CUT time between jobs...
get *extra production* from slow machines
with MILLER *Tilt-Top!*



MODEL "B" 10 TON $1175.*
The following equipment is optional and extra: hydraulic tilt control, two-speed winch, electric brakes.
**Plus 8% Federal Tax*

Time lost by slow machines in between-job travel is cut to a minimum when you have a MILLER handy. Quick tilting platform forms its own ramp while self moving equipment practically loads itself. Platform lowers, locks and you're off to the next operation with no lost motion. It's the *extra* trailer for *extra* production . . . cuts non-productive travel time for operator as well as equipment. Standard platform is 14' x 8', optional 16' available.

IMMEDIATE DELIVERY

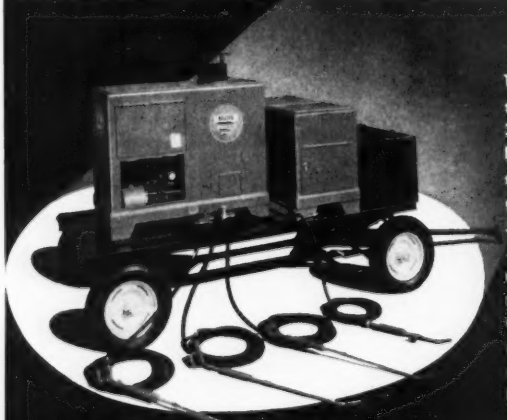
SEE YOUR DEALER or WRITE Dept. C-5

MILLER Tilt-Top TRAILERS

MILLER RESEARCH ENGINEERS

457 SOUTH 92nd ST. MILWAUKEE 14, WIS.

America's Most Powerful Cleaner



Three high-volume steam guns supply 300 gallons per hour . . . water gun supplies 1000 gallons per hour at 500 lbs. per sq. in. . . . hot or cold. All may be operated simultaneously. Grease, grime and muck are no match for a Kelite Power-Master.

Send for free illustrated broadside

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KELITE PRODUCTS, INC.
1250 N. Main St.
LOS ANGELES 12, CALIF.
Offices in 86 Principal Cities

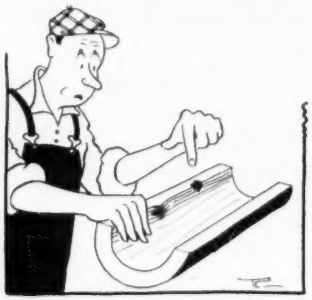
KELITE-O
SCIENTIFIC CLEANING THROUGH pH CONTROL

KELITE pH Control

introduced into the bearing metal.

The bearing material being, in most cases, softer than the shaft, foreign material is imbedded in the bearing and then coasts through life cutting away at a good crankpin.

This piece of foreign material imbedded in the bearing must displace an amount of bearing material equal to the volume of the



offender. The displaced material is projected as a raised portion of the bearing, and it adds to the failure. The raised portion of the bearing then carries a greater portion of the imposed shaft load.

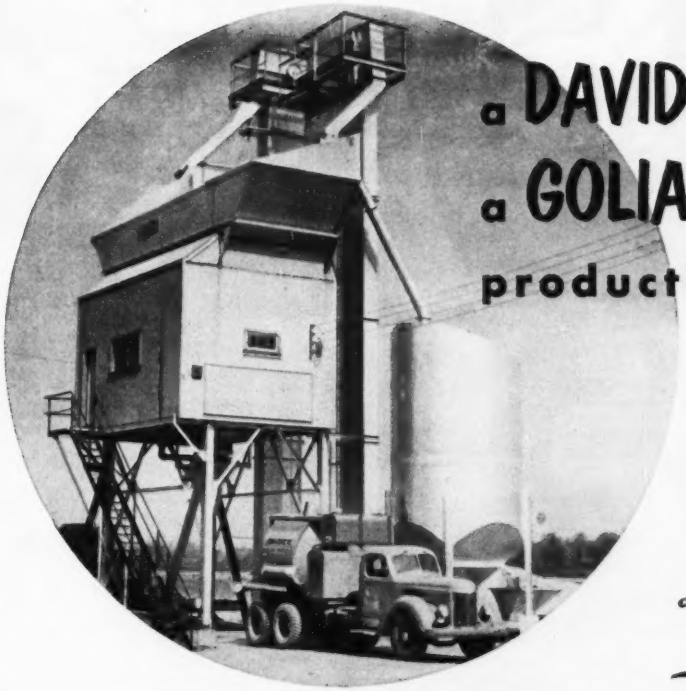
If the amount of foreign material imbedded is of any consequence, raised portions of the bearing are carrying altogether too great a load, and the lubricant will not be able to get to the high-pressure spot. Bearing failure is in the making; excessive heat is developed, and eventually some oil salesman is due for an unpleasant phone call for a situation that is not of his making.

There are few bearing failures on new engines. It is pretty well agreed that bearing difficulties begin after the original installation has served a reasonable life. The replacement generally is the one that deals out trouble. And the human element in our own back yard is at fault more than some manufacturer far removed.

Assuming that the greater portion of bearings in the high-speed diesel engine are of the thin-shell precision type, we are faced with a great number of human and mechanical problems in making bearing replacements. It is interesting to note the long, successful service, gotten out of most engine bearings, in spite of haphazard replacements and many other unfavorable factors.

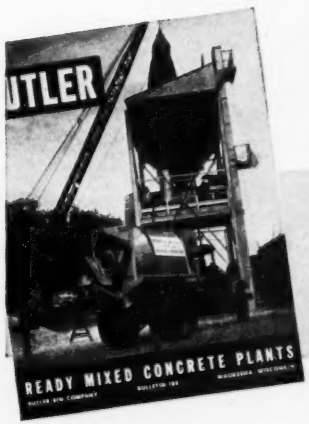
Cocked connecting rods, for instance, many times are being re-

(Continued on page 118)



a DAVID in size . . . a GOLIATH in production . . .

Remarkable portability **is the keynote of this BUTLER Ready Mixed Concrete Plant. The 85 yard 4 compartment bin ships in one piece. Legs and bracing, when knocked down, complete a load for one flat car or low-bed trailer. A second load is made up of elevator, batchers and one-piece overflow cement bin. Erection is quick and easy with a crane and 3 men.**



A number of portable BUTLER Ready Mixed Plants as well as many installations of BUTLER *engineered design* are shown in Butler Bulletin 185. Write for your copy today.

Portability **makes location at your job site practical; eliminates a large investment in costly truck-mixers. And with well co-ordinated delivery of materials either to crane, belt conveyor or elevator — production will be equal to the usual Goliath-like plant.**

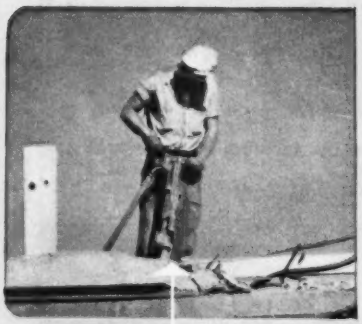
As a permanent installation **in small communities — or as multiple unit installations strategically located in and around metropolitan areas, the plant's versatility in production and the low investment required means lower cost per cubic yard and a correspondingly greater profit.**

BUTLER BIN CO. **949 Blackstone Ave. WAUKESHA, WIS.**

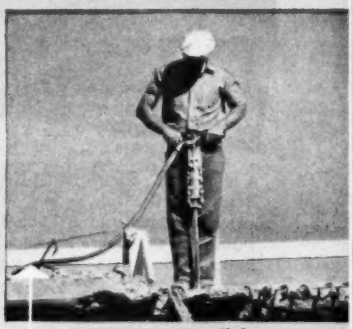
LE ROI

Air

LE ROI GIVES YOU MORE FOR YOUR MONEY!



Le Roi-CLEVELAND Breakers and Spades pack plenty of punch for speedy work in the hardest concrete or stiffest clay. Protective air-cushion in front end assures long life. Well balanced for easy handling. That's why operators like them — do more work with them. Sizes, 18 to 80 lbs.



Le Roi-CLEVELAND Sinkers have strong rotation, powerful blow from snappy valve action. Drill more inches per minute. Easy to hold, kickback is reduced. Operators get less tired, drill more feet per shift. Sizes, 17 to 82 lbs., including the popular H10 and H111.

Pair gets more done—costs less to own

A team you can't beat!

Le Roi AIRMASTER Compressor and Le Roi-CLEVELAND Air Tools

YOU'RE money ahead, when you hook up Le Roi-CLEVELAND Air Tools to a Le Roi Airmaster Compressor. They *work together*, to put more profits in your pockets!

You can't beat an Airmaster, when it comes to producing air at low cost. Super-finished, cushioned valves help your Airmaster deliver air efficiently and dependably — and maintain higher average working pressures. Slow operating speeds and conservative rating provide protection against on-the-job failure, reduce wear-and-tear.

Le Roi-CLEVELAND Air Tools include paving breakers, hand-held drills, wagon drills, drifters, spades, and backfill tampers. Their exclusive valve action keeps air consumption low. They're built to take it, too.

That's why you see Le Roi Airmaster—Le Roi-CLEVELAND teams at work on so many jobs in so many different places!

Have your nearest Le Roi distributor show you a team in action. Call on him now. Write for bulletins.

Compressors
Tractair
Rock Drills
Engines

LE ROI COMPANY MILWAUKEE 14, WIS.
Plants: MILWAUKEE • CLEVELAND • GREENWICH, OHIO

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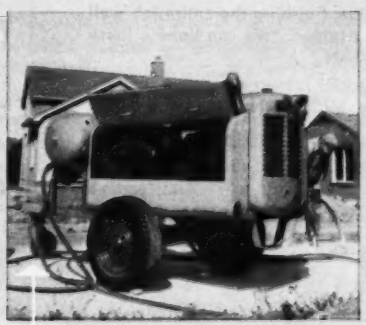
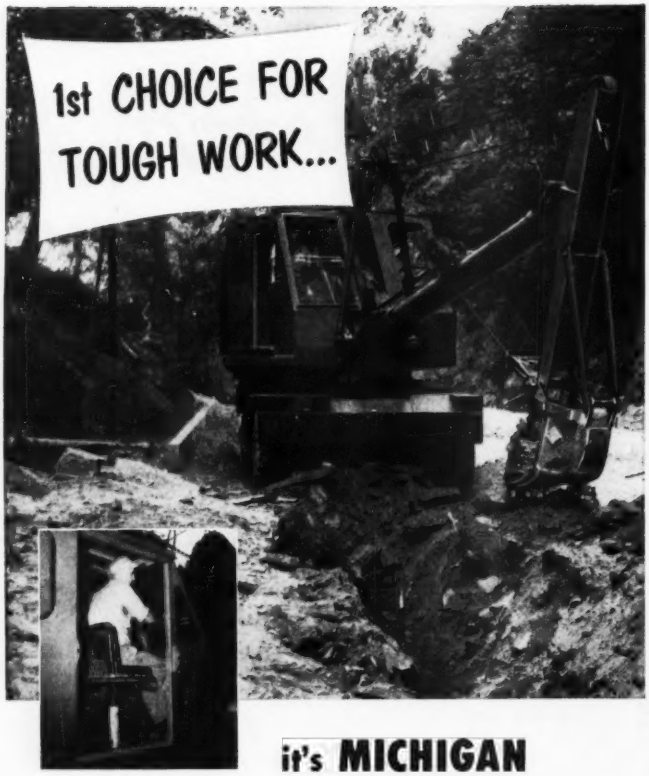
MORE AIR POWER! MORE FOOTAGE! MORE PROFITS!

Le Roi-CLEVELAND Wagon Drills put your deep holes where you want them for better breakage, lower costs. Drill at any angle. 4" bore, powerful force of blow, strong rotation, thorough hole-cleaning action. Higher drilling speed with big bits. For shallow holes, the lightweight DR34 unit is your best bet.



Le Roi Airmasters have 10% to 30% lower piston speed—for less wear, longer life, lower fuel consumption. Heavy-duty Airmaster engine is designed especially for compressor service — it is not just an automotive unit slowed down. Airmasters stay on the job longer, produce more air for less. Sizes, 60 to 600 cfm.

Tractair is a combination tractor-105 cfm compressor that can be equipped with a wide variety of attachments. Does the work of specialized equipment — breaking, drilling, digging, tamping, loading, lifting, backfilling, snow-plowing, etc. Saves you money on initial investment and on job costs.



Operator Ernest Duff likes MICHIGAN'S air controls and the accessibility of engine and clutches.

it's MICHIGAN exclusively for James Armour Excavating Co.

Owner of eight MICHIGAN Excavator-Cranes, this Philadelphia contractor is for MICHIGANS 100%. Why? His first MICHIGAN convinced him that they have what it takes.

In a housing project, a MICHIGAN Truck Hoe removed and re-laid 1,000 feet of 6-inch water line at a lower depth to accomodate a new street grade. The MICHIGAN trenched down to hard rock. The rock was then blasted and the MICHIGAN completed the trench and re-laid the water line, finishing the entire job well within schedule. Says owner Jim Armour: "We can handle these jobs at lowest cost with a MICHIGAN."

Whether or not your work is in rock . . . next time you need an excavator-crane . . . investigate MICHIGAN ⅜-yd. and ½-yd. excavator-cranes . . . your best buy!

MICHIGAN POWER SHOVEL COMPANY
495 Second Street, Benton Harbor, Michigan, U.S.A.

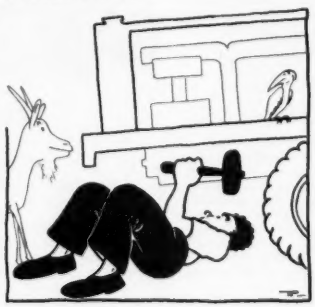
MAINTENANCE SHOP . . .

Continued from page 114

bushed and installed and still give good bearing life. Yet this is an important point in the proper installation of these bearings. Connecting rods and caps, and blocks and caps are precision-ground, with the caps in one position—a position in which they must forever function. Yet engines are being torn down, rebuilt, and these caps reversed. A few thousandths of an inch distortion here can play havoc with a good new bearing that is lubricated properly. Yet the lubricant gets the blame in many cases.

Rough and undersized shafts and crankshafts with flat spots add to failures. Distorted crankshafts, though in the minority, add to the discomfort of the owner who is carrying the down-time.

Care in handling all parts connected with bearing replacement is of highest importance. And cleanliness is a **must** with precision-type bearings. Tactics once employed on old style bearings used on slow speed engines will not do. On those jobs the mechanic got by with a bearing scraper and plenty of persuasion with a big hammer. That procedure is out.

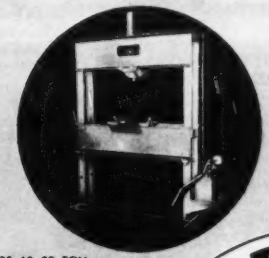


In most cases bearing caps cannot and must not be filed down to get a fit. This does nothing but reduce the vertical diameter without affecting the horizontal diameter; merely pinches the bearing into the bore, and trouble is the answer.

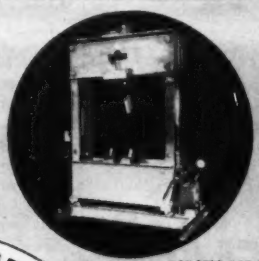
Precision bearings must fit the bearing bore in the rod and block solidly. This snug fit is necessary if the bearing is to give complete satisfaction, for several reasons. It assists the bearing to oppose the force of the loaded shaft that tries to turn the bearing in the bore.

Also, without a good snug fit, an air space remains. Still air is a poor conductor of heat. Excessive amounts of heat will be retained

(Continued on page 120)

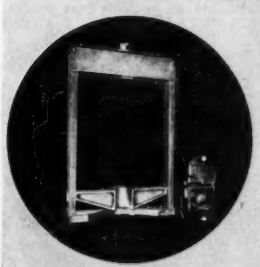


RODGERS 60-80 TON SHOP PRESS

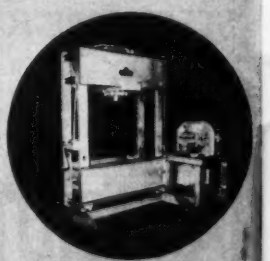


RODGERS 100 TON SHOP PRESS

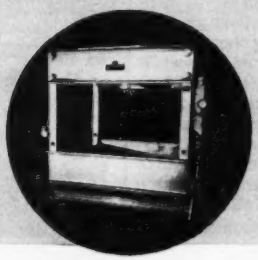
HYDRAULICS Rodgers KEEP THE WORLD MOVING



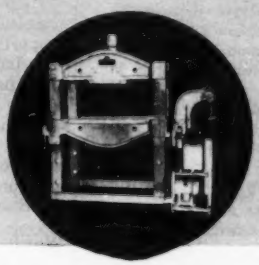
RODGERS SPECIAL SHOP PRESS



RODGERS 150-200 TON SHOP PRESS



RODGERS SPECIAL 100 TON SHOP PRESS



RODGERS 300 TON SHOP PRESS

FOR 101 UNUSUAL JOBS THERE'S NOTHING LIKE A

RODGERS SHOP PRESS

YES, a Rodgers Hydraulic Shop Press is about the handiest piece of equipment you can find for those many pressing, forming, bending and straightening jobs, for die tryout, short production runs and scores of other uses. They are versatile, time-and-labor-saving presses with construction and operating features that make them adaptable to all requirements . . . Standard model presses are available in 60, 80, 100, 150, 200, 300 and 400 ton capacities with hand or power pumps—special or modified units will be supplied to specifications.

Send for Catalog

Rodgers Catalog No. 313A has descriptions and specifications on the complete line of Shop Presses.

HYDRAULICS Rodgers

Rodgers Hydraulic, Inc.

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HYDRAULIC POWER EQUIPMENT

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WYTEFACE* STEEL TAPE FOR CLARITY...FOR DURABILITY

You'll find . . . FAVORITE® WYTEFACE is the only steel tape of its length with jet black markings on a white background (footmarkings in red) for easy and instant readings in any light!

You'll find... FAVORITE WYTEFACE is particularly durable, too. Full-strength steel line—resists kinks, wear and rust!

Available in 25, 50, 75 and 100 foot lengths. Your supply house or hardware store carries a full line.

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"I'll take the WHITE one every time!"

KEUFFEL & ESSER CO.
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MAINTENANCE SHOP . . .

Continued from page 118

in the bearing and will contribute to the early failure of that bearing. When one bearing starts to fail, an additional load is imposed on the neighboring bearings, and then they begin to fail in turn.

The greatest offender in the matter of poorly seated bearings is dirt. This comes from carelessness in making the assembly. Bearing backs and bores must be clean and free from all foreign matter. This includes heavy greases and other compounds used for protection of bearings in shipment and storage.

Bearings must be checked for distortion in themselves. They are damaged occasionally in shipping and handling. If not repairable, they should not be used. A bit of dirt between the bearing back and the bore will cause bearing distortion, imposing heavy loads on a concentrated area. Also, an air space will be created that may lead to excessive heating in a concentrated area. Keep the bearing back as clean as the bearing surface. It is important.

An old catch question for mechanics asks, "What portion of a properly fitted bearing should touch the shaft?" The correct answer is —no part of it, since a bearing at all times must float on a film of oil. Therefore, if a portion of a bearing is in direct contact with the shaft for any length of time, excessive friction heat is generated, and a bearing failure is en route.

Watch Those Filters

Engines operating with precision-type bearings must be equipped with efficient air and oil filters, and these filters must be kept in such condition that their high efficiency is maintained. If the crankcase oil is kept clean, it will give many hours of excellent service and there is then no reason to use an inferior oil. The better and more expensive oil will be much cheaper in the long run, as it will give good service for a long period of time, if kept clean.

Most mechanics go to great lengths to get proper bearing clearances—then overlook a lot of other important items, such as those outlined. However, bearing clearances are essential, and they should be kept within limits set by the manufacturer. A rule-of-thumb is one thousandth for each inch of shaft diameter, but that alone will not do. Manufacturers have good reasons for set limits. Follow them.

UNI-BATCH
Cost Saving Equipment
Use With 6S to 16S Concrete Mixers—Inclusive

Charge bin with end loader having mechanical or hydraulic type bucket.

Pat. Pending

Pull Uni-batch behind pick up truck.
Write or phone for more details
Winslow Scale Company
Terre Haute, Indiana—P. O. Box 1198
Used In 20 Different States

on the world's
BIGGEST
wire rope jobs . . .

experienced riggers demand
GENUINE
CROSBY
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Drop-forged, hot-dip galvanized wire rope fasteners
• SIZES FOR ALL WIRE ROPE •
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

50-TON ON AIRPORT

FOUR-UNIT ON DAM

SIX-UNIT ON HIGHWAY

Southwest Compaction Rollers

SET NEW RECORDS for compacting heavier lifts with fewer passes. On the big jobs where maximum compaction is required the Southwest gets the work done quickly and efficiently.

Weight-box units of Southwest Compaction Rollers oscillate up and down independently and provide a constant, uniform compacting load on each tire regardless of ground contours. There is no bridging, no shifting of load from tire to tire.

Sectionalized tubular yoke allows the use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 100 tons, suitable for light, medium or heavy duty compacting of earth.

Write for information

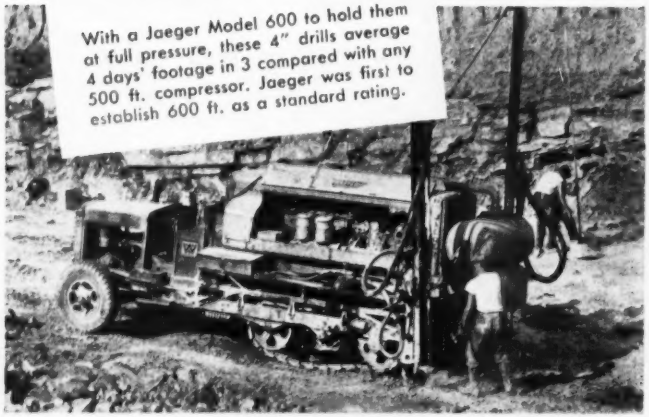
CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

Alhambra, California

HAULING SCOOPS · BULLDOZERS · LOADERS · BOTTOM DUMP WAGONS · RIPPERS · TAMPERS · SCRAPERS · TREE DOZERS

40% more footage with JAEGER air-plus pressure


With a Jaeger Model 600 to hold them at full pressure, these 4" drills average 4 days' footage in 3 compared with any 500 ft. compressor. Jaeger was first to establish 600 ft. as a standard rating.

Want to cut costs? See your Jaeger distributor or get Catalog JC-1

4 days' work in 3 is possible on many jobs where Jaeger's increased "new standard" ratings step up the speed and hitting power of air tools. A Jaeger 75 will efficiently run one heavy breaker. A Model 125 will run two. Jaeger's 185, 250 and 365 ft. models deliver 25 to 50 cfm more air than "old standard" compressors to run larger tools at full efficiency.

THE JAEGER MACHINE COMPANY 800 Dublin Avenue Columbus 16, Ohio

PUMPS • MIXERS • TRUCK MIXERS • PAVING SPREADERS and FINISHERS

FASTER PIPE LAYING . . .
NO TRAFFIC INTERFERENCE
HYDRAUGER*
REG. U. S. PAT. OFF.
OPEN HOLE
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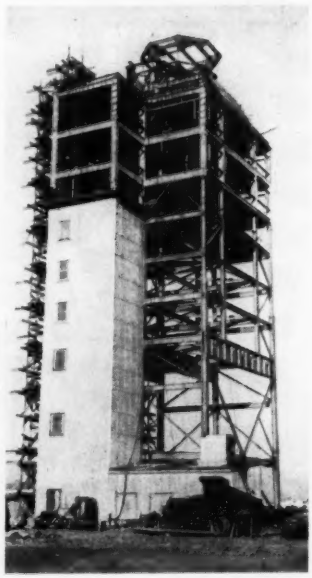
Get Booklet
. . . shows the incredible savings Hydrauger makes in both time and cost.
BORES
2" through 24"
DISTANCE
up to 225 feet or more, per setting, depending on earth formation being bored.
HYDRAUGER CORP. Ltd.
681 Market Street
San Francisco, California
*Earth Boring Tool

Welded Studs Hold Tower Siding



CONTROL TOWER at New York airport will have lower seven floors left open until a terminal is built around it sometime later.

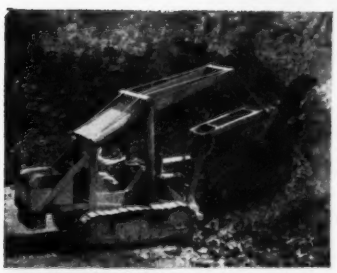
AN IMPOSING aircraft control tower dominates the skyline at the Port of New York Authority's International (Idlewild) Airport. The recently completed structure stands 150 ft high, but the lower seven floors are not inclosed at all. That's because the tower will eventually be incorporated into a new permanent terminal building that is to replace the present temporary facilities. Even though most of the tower is thus open to the breeze, it required more than 16,000 sq ft of Transite corrugated asbestos siding to inclose the two main upper floors, a penthouse and control room, and an access shaft.

The siding was fastened by bolting the sheets to threaded studs end-welded to the structural steel frame with a Nelson stud gun. It was just necessary to trowel waterproofing mastic on the end ridge of one sheet, place the next piece of Transite, drill a ½-in. hole through the overlap, weld a Nelson stud to the frame through the hole, and run down a hex-head collar nut. All work was done from swinging scaffolds outside the structure—no

(Continued on page 124)

We Engineered the Mechanical Advantages Of Big Shovels into the Dempster-Diggster

The Dempster-Diggster's ability to dig hard and stratified materials without shooting is shown in photo at right. Note ample loading clearance. Dempster-Diggster, shown at work in Florence, Ala., is the Type GRD, Model 100.



This Dempster-Diggster, shown at work in Creighton, Pa., is also loading hard and stratified material without shooting. It is the Type CR, Model 100.

The Type GRD, Model 100-HL is shown above loading Hopper Bottom car, height of which is 10'8" from rail to top of car.

Simultaneous Independent Hydraulic Crowding and Hoisting. Variable Crowd Action at Any Dipper Position and Changeable Buckets are engineered into the Dempster-Diggster. Many of the present Dempster-Diggster owners were at one time in the same position you may be in today. They needed front end loaders, but they also needed shovels that could dig out 15 to 18 foot banks. The versatility of the Dempster-Diggster, plus its economical and efficient operation, left them with only one choice. In the first place, the Dempster-Diggster can do anything a conventional front end loader can do—and do it faster and at less cost! Second, on big jobs the Dempster-Diggster is without equal for working in tight places. The Dempster-Diggster is available in either of two types of traction—pneumatic (Type GRD) or crawler (Type CR). Both types are supplied in two models—the Standard (Model 100) or High Lift (Model 100-HL). Our new catalog No. 1032, with over 35 illustrations and complete specifications, shows how this revolutionary shovel can cut your costs tremendously. For your copy fill in the attached coupon and mail today!

DEMPSTER DIGGSTER

Please send me, without obligation, your Dempster-Diggster Catalog #1032.

Name_____

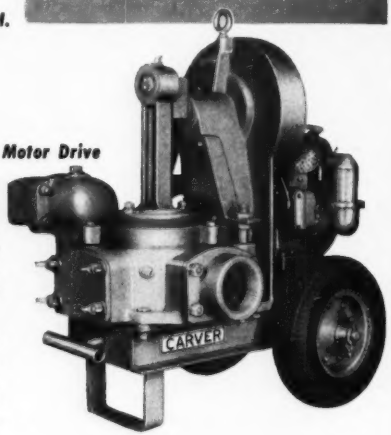
Address_____

City_____ State_____

DEMPSTER BROTHERS, 352 Shea Bldg., Knoxville 17, Tennessee

For the Pump to handle the Roughest, Toughest Jobs with ease depend on CARVER DIAPHRAGM PUMPS

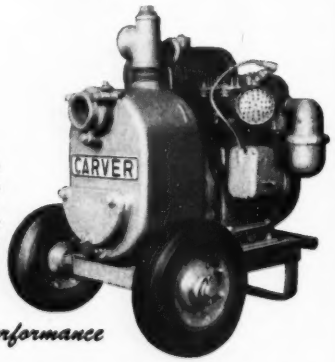
★ *4" Suction and Discharge*
★ *Capacities up to 6,000 G.P.H.*
★ *Timken Roller Bearings*
★ *Non-Clogging Valves*
★ *Long-Life Diaphragm*
★ *Enclosed Transmission*
★ *Gasoline Engine or Electric Motor Drive*



Designed from suction to discharge for rugged dependable pumping they're loaded with reserve power and stamina to handle sludge, mud, seepage, grit, sewage and septic tanks with the greatest of ease.

Nothing fragile about these pumps, no underpowering, no compromise on quality. Throughout their many years Carver Pumps have earned an enviable reputation on the toughest construction jobs.

Specify CARVER *for the* Complete QUALITY LINE



CARVER manufactures a complete line of the highest quality self-priming pumps in all sizes from 4,000 to 240,000 G.P.H. gasoline engine, diesel, motor or belt drive. See your CARVER Distributor or write for Bulletin No. 110.

CARVER CONTRACTOR PUMPS
. . . the best buy for better performance

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CARVER PUMPS

MASTIC IS SPREAD to insure a watertight joint between the Transite sheets that inclose only the top floors and access shaft.

THREADED STUD is welded to structure with Nelson stud gun through a hole drilled in the siding.—Nelson Stud Welding photos

interior scaffolding was required. One four-man crew handled the access shaft inclosing, but a second helped out above the seventh floor.

General contractor for the control tower construction, at $617,000, was Wortman & Sons, Inc., of New York City. The L. P. Kent Co., also of New York, installed the siding.

In Construction work...

Here's Gas Savings up to 14%

...MORE SPEED-HAULING POWER, TOO!

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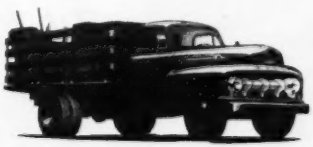
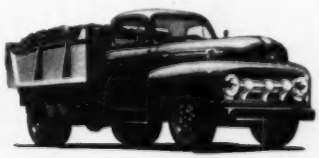
SERIES F-7 BIG JOB is truck leader among the "extra heavies"! It's rated for 19,000 lbs., G.V.W. New 145-h.p. CARGO KING V-8 develops more power per cu. in. than any other gasoline truck engine built by major truck producers. Short-stroke design cuts piston travel 20%. 5-speed transmission. 15-in. by 5-in., double cylinder rear brakes.

NEW 6½-FT. PICKUP offers one of the biggest bodies in the half-ton field plus low 2-ft. loading height! Choice of 101-h.p. LOW-FRICTION Six, or famous 106-h.p. Truck V-8.



FORD F-5 12-ft. (shown) or 9-ft. Stake. 14,000 lbs. G.V.W. Single- or 2-speed rear axle. Heavy duty 4-speed transmission gives easy shifting and long life. Choice of V-8 or Six engines.



FORD F-6 with special Dump body. Also available with standard 9-ft. and 12-ft. Stake and Platform bodies. Double channel frame. Choice of 106-h.p. V-8 or 112-h.p. BIG SIX.

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STANDARD

How to Construct a Batten-Seam Roof

THE SOOTHING PATTER of rain on a "tin" roof is a fond memory to many persons. But in recent years other types of roofing have been more popular, and the metal roof has not been so much in evidence.

Now the Follansbee Steel Corp., manufacturer of Terne Metal Roofing, reports that architects are specifying metal roofing more and more, not only for durability, but also for the way it meets design and structural requirements.

One desirable architectural feature inherent in the construction of terne metal roofs is the various types of seams possible to join roofing strips. They can be made up to present an interesting pattern of lines and shadows, yet present sturdy durability.

Follansbee Steel says that architects in increasing numbers are specifying batten seams—both for design beauty and rigidity. Construction men are likely to have more of these jobs in the future. Techniques differ, but here is a step-by-step procedure taken by experienced roofers to install a batten-seam roof. The illustrations were made from on-the-job photographs.

One of the factors responsible for the revival of this traditional roof is the availability of continuous rolls of seamless terne metal in 50-ft lengths and in a selection of handy widths that make possible variety in spacing—without waste and eliminating troublesome cross-seams.

The terne metal roll is opened with the painted side down. Cut a strip to the length required. The lengthwise edges are turned up to the height of the batten to be used, plus ½ in. The strip is secured to the roof by cleats hooked over the turned-up edges and nailed to the roof sheathing. Cleats should be staggered along the seams (*Fig. 1*).

For the roof edge, a length of terne metal is cut 2 in. wide. One-half inch of this edge strip is bent at a right angle to the rest. The strip is then nailed to the edge of the roof sheathing so that the 1½-in. leg projects below the sheathing (*Fig. 2*).

The lower end of the roofing strip is trimmed ½ in. beyond the edge strip. The upturned edges are

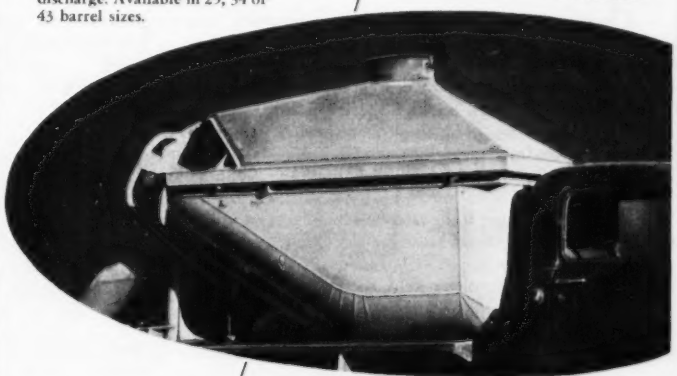
(Continued on page 130)

HERE'S A NEW LOW-COST BULK CEMENT HAULER...

. . . that converts quickly into a *concrete* body, or into a hauling unit for *sand, gravel, earth or water.*

The Dumpcrete Bulk Cement Body is simply a standard Dumpcrete unit with a removable cover. When the cover is in place, the body is completely closed, permitting top speeds with no loss of cement. Full control over discharge is assured by positive cut-off gate and quick-acting, three-position hoist valve. The 90-degree dumping angle and rounded interior corners give complete, clean discharge. Available in 25, 34 or 43 barrel sizes.

Standard Dumpcrete bodies haul 2, 3 or 4 yards of pre-mixed concrete, discharge through special "Hi-Gate" and place just about anywhere through long, completely adjustable chute. Cost less to buy, to operate and to maintain.



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Adding a torque converter, electric shift, and electric steer control, to 19 m.p.h. Tournadozer is another development to help you move dirt faster and at lower costs. With these additional features Tournadozer becomes an even greater producer on high-speed pushing, pulling and dozing assignments. The single-stage torque converter is a simple, trouble-free type, which combines the advantages of a hydraulic torque converter and a fluid coupling. Teamed with the constant mesh transmission, it provides an infinite speed range from 0 to 19 m.p.h., and automatically selects the proper ratio for delivering maximum power in a steady, even flow to Tournadozer's wheels. This enables the engine to operate at maximum r.p.m. and at highest efficiency. Torque converter absorbs practically all shock-loads between engine and drive wheels . . . adds efficiency . . . means more work done dozing, climbing grades, pulling through mud, snow, ice, sand. It improves performance in any type of difficult operation, increases accuracy in holding cuts to grade and in close finishing.

Combining low-pressure, 21.00 x 25 rubber tires and constant-mesh transmission with torque converter, Tournadozer gives you the smoothest running dozer you've ever seen! You get instant speed selection at the touch of an electric switch . . . no delay . . . no de-clutching or loss of vital momentum for shifting gears.

Wheel speeds are automatically adjusted to give you maximum power delivery in gear range selected, thus eliminating shock loads or need for frequent gear change. With 4 forward speeds, 2 reverse, plus torque converter, you get an infinite speed range with most effective use of power over every foot of the way. This constant, smooth power, always available contributes to increased output plus lower maintenance and longer machine life.

Check all the advantages you get from new torque converter, plus the new electric shift and steer control, which combine to make Tournadozer by far the fastest, most efficient dozer money can buy. It will pay you to contact your LeTourneau Distributor . . . he'll be glad to show you how these advantages help Tournadozer to do more work on all your jobs per hour . . . per day . . . per year.

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5 Higher engine efficiency— constant horsepower cuts down engine wear . . . eliminates lugging . . . reduces maintenance expense . . . adds to engine life.

6 Steady engine speed—assures maximum voltage to electrical equipment . . . improves service and life of engine attachments.

7 Accurate grading — smooth, perfect balance of torque against load gives accurate control of blade at all times.

8 Single-stage torque converter — simple and trouble-free . . . not dependent on seal efficiency for converter efficiency.

9 Easier operation—smoother performance throughout cycle increases operator efficiency . . . boosts your production.

10 More yards per hour—use of maximum engine horsepower gives higher average speed, higher ratio of operating efficiency, more work done.

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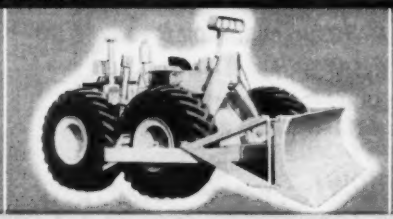

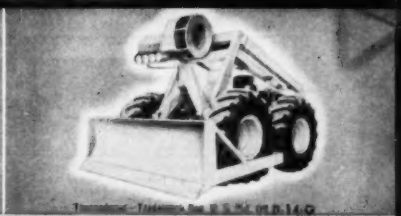

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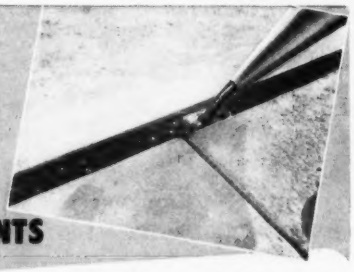

Para-Plastic prevents infiltration of water or other foreign substances under any expansion or contraction conditions of monolithic concrete.

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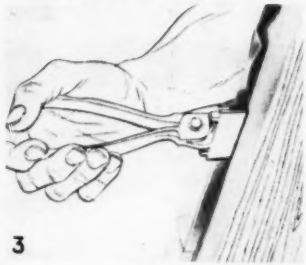
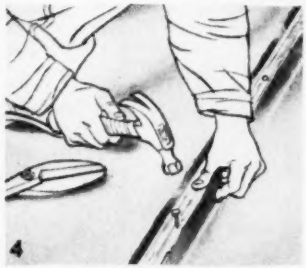
BATTEN-SEAM ROOF . . .

Cont. from p. 127





snipped so that they will bend where the roofing strip meets the edge strip, and the ½-in. overhang is turned over the edge strip and crimped around it (*Fig. 3*); following which it is malleted down to cover the nails in the edge strip.

The batten is nailed in place between the roofing strips (*Fig. 4*), and the projecting ½ in. of roofing strip on either side of the batten is malleted down away from it. A second batten is used to form a right-angle bend (*Fig. 5*). The terne batten cap is placed over the batten with its edges slipped over the extended edges of the roofing strips. The batten cap can be fabricated in the shop or at the site. Its width should be the width of the batten, plus 2 in.

Preliminary bends should be made ½ in. from either edge, with one side slightly more than a right angle and the other slightly less. This makes it possible to fit the cap over the edges of the roofing strips and to crimp the edges

(Continued on page 132)

CONTROLLED IMPACT ACTION

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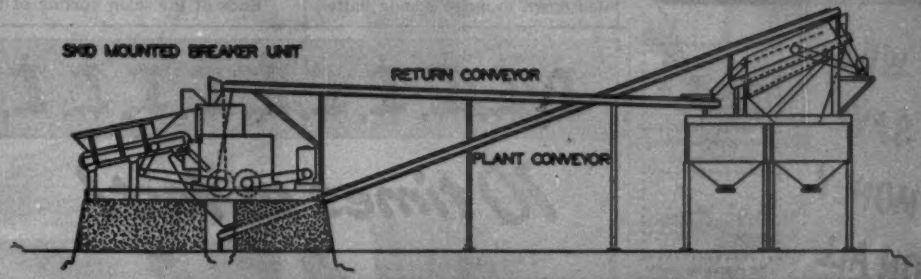
at ROCK BOTTOM COST!



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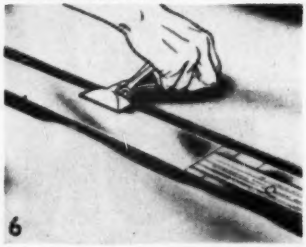
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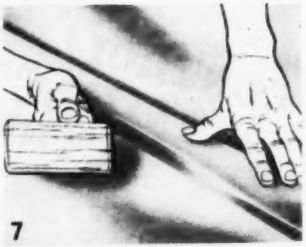
down with hand tongs to form a single locked seam (*Fig. 6*). The edges of the batten cap are malleted down to make a snug batten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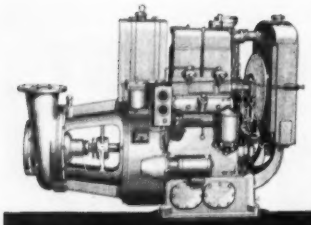
seam (*Fig. 7*). Having the hold-down cleats nailed under the battens assures a smooth-seam top.

Ends of the seam portion of the



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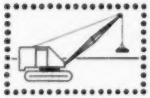
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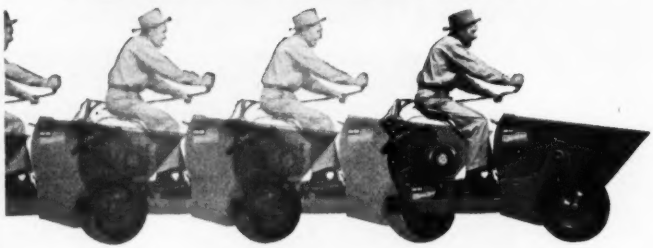

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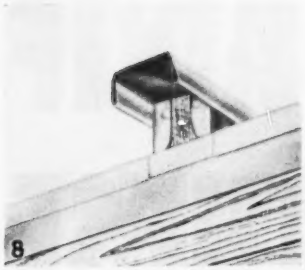

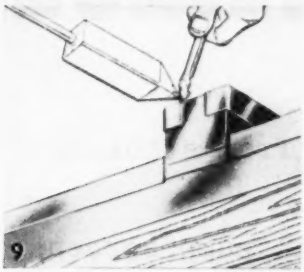

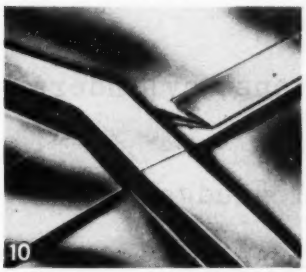

roofing strip are cut, bent around the edge of the batten, and nailed (*Fig. 8*). The doubled-over portions of the batten cap are snipped about ¾ in. beyond the end of the batten, and the corners are cut out. The top of the cap is bent down over the edge of the batten, and the doubled ends are bent over.

Then the entire end assembly is malleted as flat as possible. All joints not double-locked are soldered (*Fig. 9*).

At the ridge of the roof, the end of the batten cap is bent over to form a continuous batten seam, overlaying the cap on the opposite seam by about 6 in. Both batten caps are malleted down. Overlapping roofing strips are malleted and soldered to Z-shaped cleats nailed to the roof (*Fig. 10*).

It is possible also to use a ridge seam of terne metal. In either case, all joints not double-locked should be soldered thoroughly, to insure that all seams are waterproof and windproof.

This 4-ton traveling crane of well known high quality expends its energy and efficiency through this 3-ton capacity.

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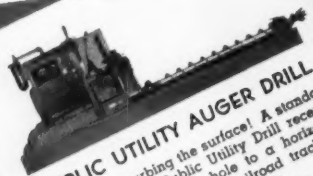

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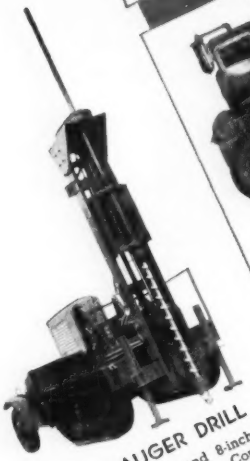
Produces 40% more 6 to 8-inch blast holes per day. Works up to 120-foot horizontal depths, using 5-foot interlocking auger extensions. Bill Mathews, of Canton, Ohio, drilled 1800' of 6" diameter holes in one day. Finger-tip hydraulic carriage control permits selection of any drilling speed up to 6 feet per minute. Four individual self-locking jacks maintain correct drilling level. Over-all length: 12 feet; width: 5 feet 8 inches.



VERTICAL AUGER DRILL

A real time-saver for 6 and 8-inch blast hole and exploratory drilling. Compactly designed for mobile mounting with 8-foot hydraulically controlled tower. Special square alloy shaft and chain coupling power combination results in smooth, positive drilling action. When in traveling position, the over-all height is only 7⅓ feet. Total weight: 4800 lbs.

THE SALEM TOOL COMPANY

765 So. Ellsworth Ave. • Salem, Ohio, U. S. A.

SALEM

Legal Decisions Concerning Construction

The Sheriff and the Safety Box

IF A CONTRACTOR gets a judgment against an owner, and places the proper paper in the sheriff's hands, the officer may stop the debtor on the street, levy on his car and take possession thereof.

If the owner has property locked up in the safety box in a bank across the street, may the sheriff obtain a court order, open the box, and levy on the owner's property contained therein?

This point came before the American Courts on several occasions, and the general rule is that the sheriff may do so.

Now, suppose that the owner and Y have a box in their names, the contractor obtained a judgment against the owner, and the sheriff applies for a court order to open the box and search for the owner's property therein.

"I've got a joint interest in that box, you've got no judgment against me, and you can't paw over my securities on the chance of finding some of the owner's," Y contends.

This point came before the New York Courts in the case of Horace *vs* Clements, 215 N. Y. S. 169 and the decision was in Y's favor, on the ground that there was no evidence that the owner had any property in the box, and Y had testified that he had not.

A Matter of Preference

IF A BANKRUPT or an individual on the eve or afternoon of bankruptcy, settles with a contractor in full, the transaction may be set aside as an unlawful "preference" within the meaning of the Bankruptcy Law.

This being so, suppose a case where a contractor holds notes of a corporation which are endorsed personally by some of the stockholders, and the corporation is tottering on the financial verge.

"I'm going after Brown, who is the best endorser on the back of the notes, and make him pay them," the contractor declares, but Brown, when approached, strenuously re-

(Continued on page 138)

ANOTHER NEW 4 WHEEL DRIVE PAYLOADER

MODEL HR

Here's the tremendous tractive ability, the mobility and the versatility of the famous Model HM "PAYLOADER" applied to this new 1 cu. yd. tractor shovel. Here's the same low, compact design . . . the same power-boosted rear wheel steering that means maximum maneuverability. And — once again — here's more than *thirty years of tractor-shovel experience* built into a single machine.

The Model HR conquers sand, snow and mud . . . works on pavement without injuring the surface . . . travels fast from job to job. It can dig tough materials, load big trucks, bulldoze, strip, excavate, stockpile, spread, lift, push and do drawbar work. There's a choice of 60 hp Diesel or 54 hp gasoline engine . . . extra attachments include bulldozer, crane hook, fork lift and snow plows.

If you want to know how much usefulness, mobility and all-around job capacity can be packed into a one-cu. yd. tractor-shovel, you have to see a Model HR "PAYLOADER" in action. Contact your Hough Distributor today. The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Illinois.

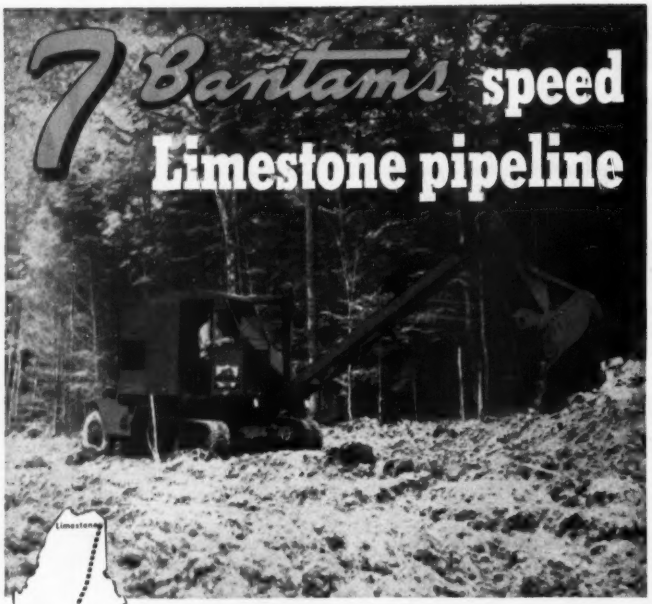
FEATURING . . .

- 4-wheel drive
- Rear-wheel Power Steering
- Four Forward Speeds
- Four Higher Reverse Speeds
- Hydraulic Bucket Control
- Hydraulic Down-pressure
- Automatic Tip-back Bucket

Write for literature on the 4-wheel drive 1 cu. yd. Model HR or 1½ cu. yd. Model HM "PAYLOADER." There are also five sizes of two-wheel drive "PAYLOADERS" — 1⅛ yd., ¾ yd., ½ yd., 15 cu. ft., 12 cu. ft.

PAYLOADER®

7 Bantams speed Limestone pipeline



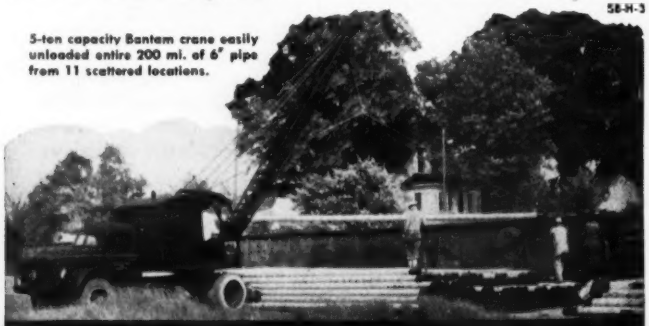
To speed excavation of the new 200-mile pipeline supplying the B-36 Bomber Base at Limestone, Me., W. H. Hinman, Inc., of North Anson, hired 6 high-speed Bantam Back Hoes, equipped with 30" buckets. A 7th truck-mounted Bantam crane unloaded the entire 200 mi. of 6" pipe from 11 widely separated sidings — *handled 19,800' from 3 locations, each 15 miles apart, in one typical day,* including travel time and positioning cars with Bantam drag cable.

Working through swamps, steep grades and difficult river crossings, where their low weight and sure-footed traction could be used to best advantage, the Bantam Back Hoes completed approximately 40 miles of trench 30" wide and 30" deep in 2 months. Despite unusually tough going, *production averaged 123.5' of trench hourly for each machine.*

You, too, can improve job efficiency with low-cost Bantams. Write for details. Schield Bantam Co., 221 Park St., Waverly, Iowa.

58-H-3

5-ton capacity Bantam crane easily unloaded entire 200 mi. of 6" pipe from 11 scattered locations.



SCHIELD BANTAM

Cranes • Excavators

Get more jobs done at less cost

LEGAL DECISIONS . . .

Cont. from p. 136

pudiates the possession of ready cash.

"I will give you my personal notes payable every four months to the amount of the notes which you hold," Brown offers.

"That'll be better than the way things are," the contractor agrees, and the notes were duly signed.

"Of course, I'm going after the corporation and make them transfer enough property to me to protect me on these notes," Brown suggests.

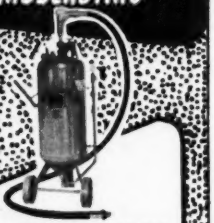
"You fellows can do your own business in your own way," the contractor assures him.

Then the corporation goes into bankruptcy, and the trustee attempts to set aside the transaction with the contractor.

"Go ahead, if you like, and set aside the transfer of the corporation's property to Brown, but as far as he and I are concerned, our transfer was fair and open, and cannot be impeached," the contractor argues.

This point came before the United States District Court in the Massachusetts case of Olmstead *vs* Trust Company 7 A. M. B. R. N. S. 774, where the court ruled in the contractor's favor.

SANSTORM modern SANDBLASTING



Each machine guarantees Sanstorm's famous Non-Stop, Non-Plug Action. Check for yourself. As rugged and dependable as it looks. There's a size for your blast cleaning needs.

For the **tough** jobs, more and more engineers are specifying SANSTORM

For Further Information Write, C. G. Spears

FREE FOLDERS

SANSTORM modern SANDBLAST MACHINES

Santa Clara & H Sts., Fresno, California

DEALERS IN ALL PRINCIPAL CITIES

ANOTHER EFFICIENT USE OF ALEMITE "FRICTION FIGHTERS"

Making field shop maintenance easier, faster

...MORE ECONOMICAL, TOO!

It's no snap—running an efficient maintenance shop out in the field. When big rigs are "pulled off the line" you have to move fast—hours—even minutes cost plenty!

Vital equipment *must* be sent back to the job quickly . . . fully repaired . . . and thoroughly lubricated in order to fight the threat of more repairs and breakdowns.

And here—in the shop, as in the field—you'll again find Alemite "Friction Fighters" on the job. Ready with an efficient, compact, fully portable lubricator that puts the final touch of lubrication to a repair job . . . helps return equipment to the line with maximum protection, in minimum time.

Shown in operation above, is Alemite Model "711-A." A powerful, high-pressure lubricator with giant 8-inch rubber tired wheels that let you roll it anywhere. Outdoors, indoors, over rough floors, up and down steps. Attached to an air compressor, this "711-A" pumps direct from 25, 35 or 50 lb. pails. Brings all the advantages of modern Service Station Lubrication right to your shop. See it. See all of the Alemite "Friction Fighters" shown here. They'll help *you* cut "downtime," too. Increase the output of *both* your men and machines!

Special Alemite Value

lever-type hand gun

- **Handles 21 full ounces of any type grease!**
- **Develops up to 6,000 lbs. pressure!**
- **Reaches fittings easily with hose and giant button head coupler!**

Easy to fill and operate, this heavy-duty lever-type gun is built for rugged wear and trouble-free service. Specifically designed for the construction industry. Has loader fitting for easy refilling without disassembly. Ask for Alemite Model 6679-J. Hose Model 6829-A.

Real Work Saver

Alemite loader pump

- **Packs guns solid with grease.**
- **Eliminates troublesome air pockets.**

Designed for use with 100 lb. drums. Keeps lubricants "refinery clean" from barrel-to-bearing. Ends all risk of dirt or contamination. Actually saves up to 3¾ man-hours for every 100 lbs. of lubricant used. Ask for Alemite Model 7198-L.

Get this FREE book!

Send today for free illustrated catalog describing this equipment. Write to Alemite, Dept. F-52, 1850 Diversey Parkway, Chicago 14, Ill.

Select Your Own

portable service station

- **You can custom build the rig you need.**
- **Get complete lubrication service—in the field.**
- **Apply oil or grease direct from barrel-to-bearing.**

New s-e-c-t-i-o-n-a-l-i-z-e-d platform units allow just the pumps, reels and hand-meters you require—assembled into one, portable rig for faster, easier lubrication—right on the job!

ALEMITE

A PRODUCT OF SW STEWART-WARNER

Freedom to work "IN THE DRY"

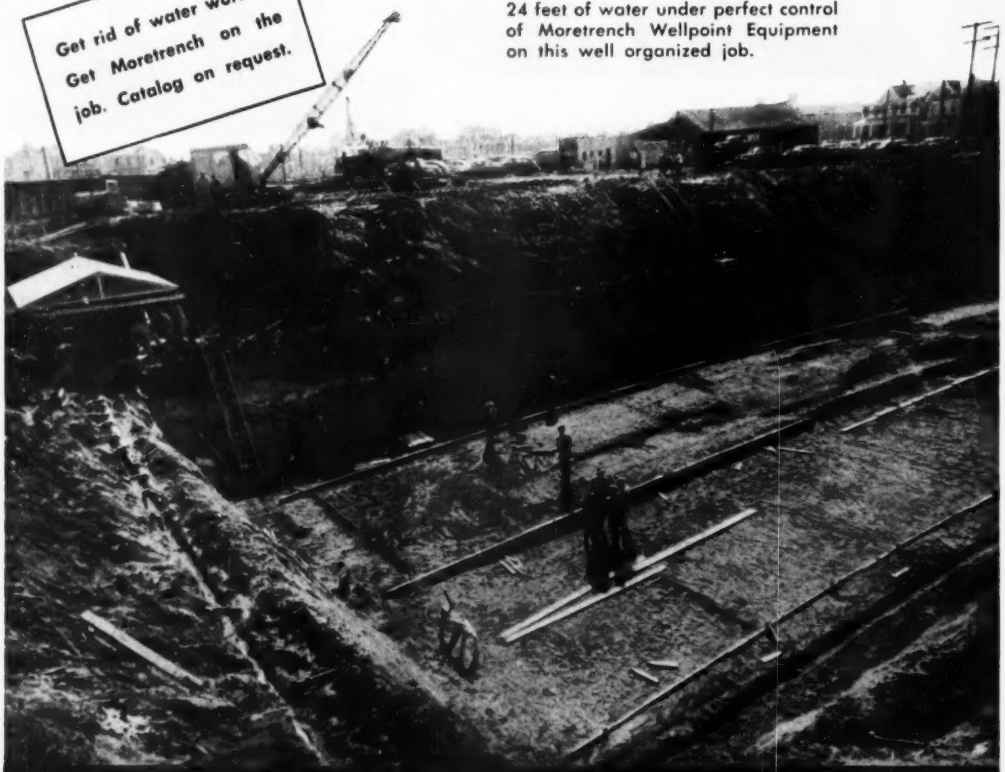
. . . another reason why a MORETRENCH WELLPOINT SYSTEM is the preferred way to solve a pumping problem.

It guarantees your freedom —

to *work* unhampered by water
to *excavate* by whatever method you choose
to *progress* as fast as you can
to *save* while you're doing it.

Get rid of water worries. Get Moretrench on the job. Catalog on request.

24 feet of water under perfect control of Moretrench Wellpoint Equipment on this well organized job.



MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Nordberg Manufacturing Co.: Appoints Overold Distributing, Inc., 13 Fourth St., Moorhead, Minn., distributors for Nordberg 4FS diesel engines for North and South Dakota, northwestern Minnesota, northern Nebraska and the eastern counties of Montana and Wyoming.

W. A. Riddell Corp.: Appoints Vern Wheeler Equipment Co., Inc., Jacksonville, Fla., distributor for WARCO motor graders for northern section of Florida and southern Georgia. Also, Northfield Iron Co., Northfield, Minn., will handle WARCO's in Minnesota and three counties in Wisconsin. Also, Lund Machinery Co., Salt Lake City, Utah, will distribute WARCO graders in Utah and parts of Idaho and Wyoming. And Ferro-Craft Engineering Co., Montgomery, Ala., will sell and service them in Alabama.

R. G. LeTourneau, Inc.: Appoints Rocky Mountain Machinery Co., 1485 S. Second West St., Salt Lake City, distributor for Utah, three counties in Wyoming and 13 counties in Idaho.

Drill Bit & Tool Co.: New distributors for Midland Throwaway forged steel rock bits are Allied Equipment, Inc., Miami; Austin Powder Co., Cleveland; Guvan Machinery Co., Logan, W. Va.; Mine & Mill Supply Co., Birmingham; Schroeder Brothers, Pittsburgh; and the E. F. Marsh Co., St. Louis.

Cleaver-Brooks Co.: Appoints the Dyke & Tutsch Co., 3253 N. Green Bay Ave., Milwaukee, Wis., as manufacturer's representative for C-B boiler equipment.

Koehring Co.: Ruffridge-Johnson Equipment Co., 250 Tenth Ave., South, Minneapolis, Minn., becomes distributors for the complete line of Koehring heavy-duty construction equipment, along with products of the company's three subsidiaries; C. S. Johnson, Parsons and Kwik-Mix, for the entire state of Minnesota.

Universal Form Clamp Co.: Products for concrete construction industry now are distributed in the Northwest by McCracken-Ripley Co., 2221

(Continued on page 144)

Heltzel BUILDS IT BETTER

HELTZEL HELPS CONSTRUCTION DOLLARS GO FURTHER

AT THE TRANSCONTINENTAL LINK
Where the Pennsylvania and Ohio Turnpikes will join

PROBLEM: Forms that guarantee meeting the most rigid inspections ever encountered on paving construction.

ANSWER: Heltzel steel forms because they are rigid and joint-locked to carry heaviest equipment without wobble. They last for job after job of rugged use.

FIVE RIGID SUPPORTS PER FORM
Only Heltzel makes a form with five positive and rigid tread supports per form. The three stake pockets are welded to the lip of the tread and the upturned base flange. At each end, the sliding joint lock bolsters the joint.

UPTURNED FLANGE
Only Heltzel provides 50% extra strength with each form, by incorporating the upturned flange as standard design.

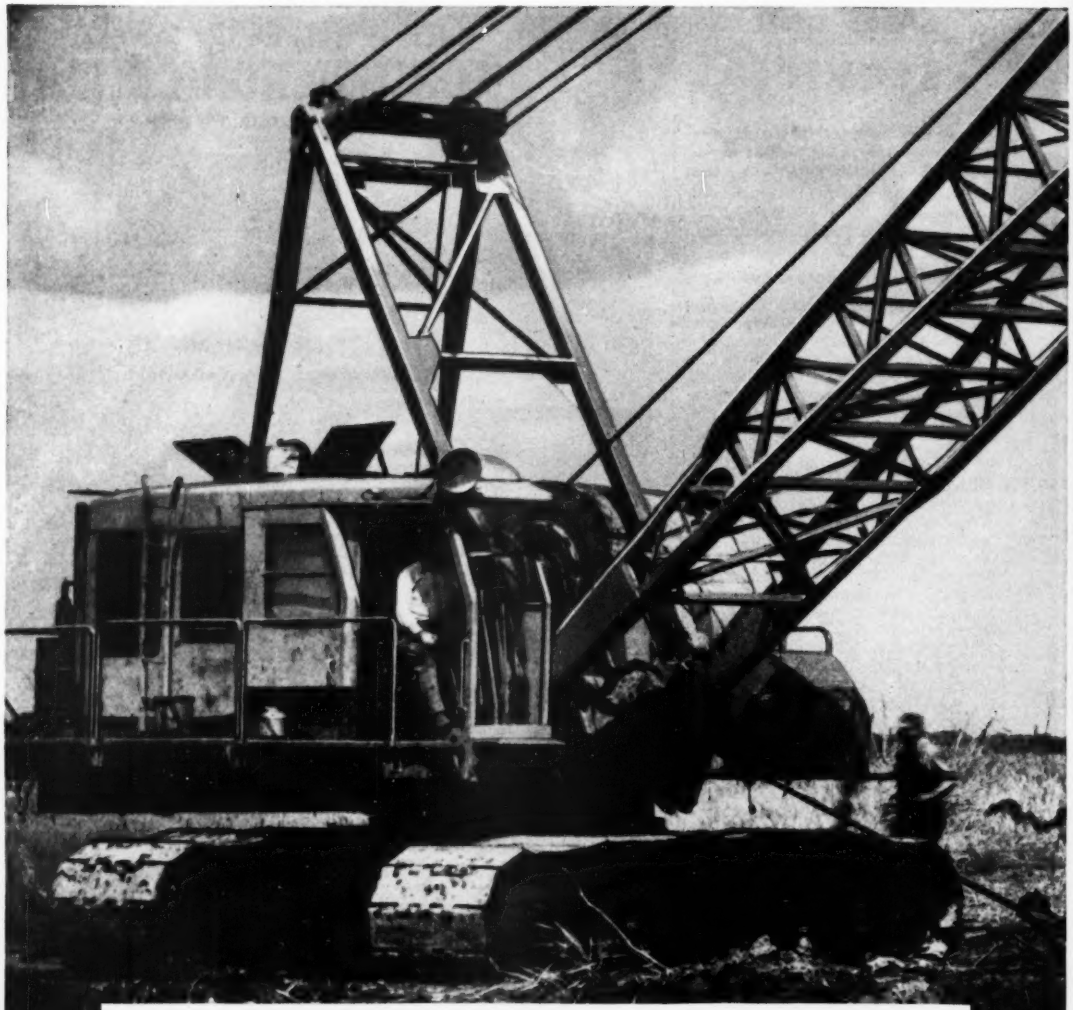
EXCLUSIVE STAKE POCKETS
Only Heltzel makes this wide protected-type stake pocket for sure-grip wedging, and rigid support of the tread.

STAKES
Only Heltzel makes stakes from rerolled rail material with hot forged points.

WIDE TREAD
Heltzel makes a form with 2½" tread for greater traction, and for the greatest rigidity and strength.

HOT PRESSED JOINT LOCK
Only Heltzel makes a joint lock, hot pressed from ¼" plate, with driving ears projecting 3½" from the form.

Heltzel BUILDS IT BETTER
The Heltzel Steel Form & Iron Company
Construction Equipment Since 1910
WARREN, OHIO
Flex-Plane

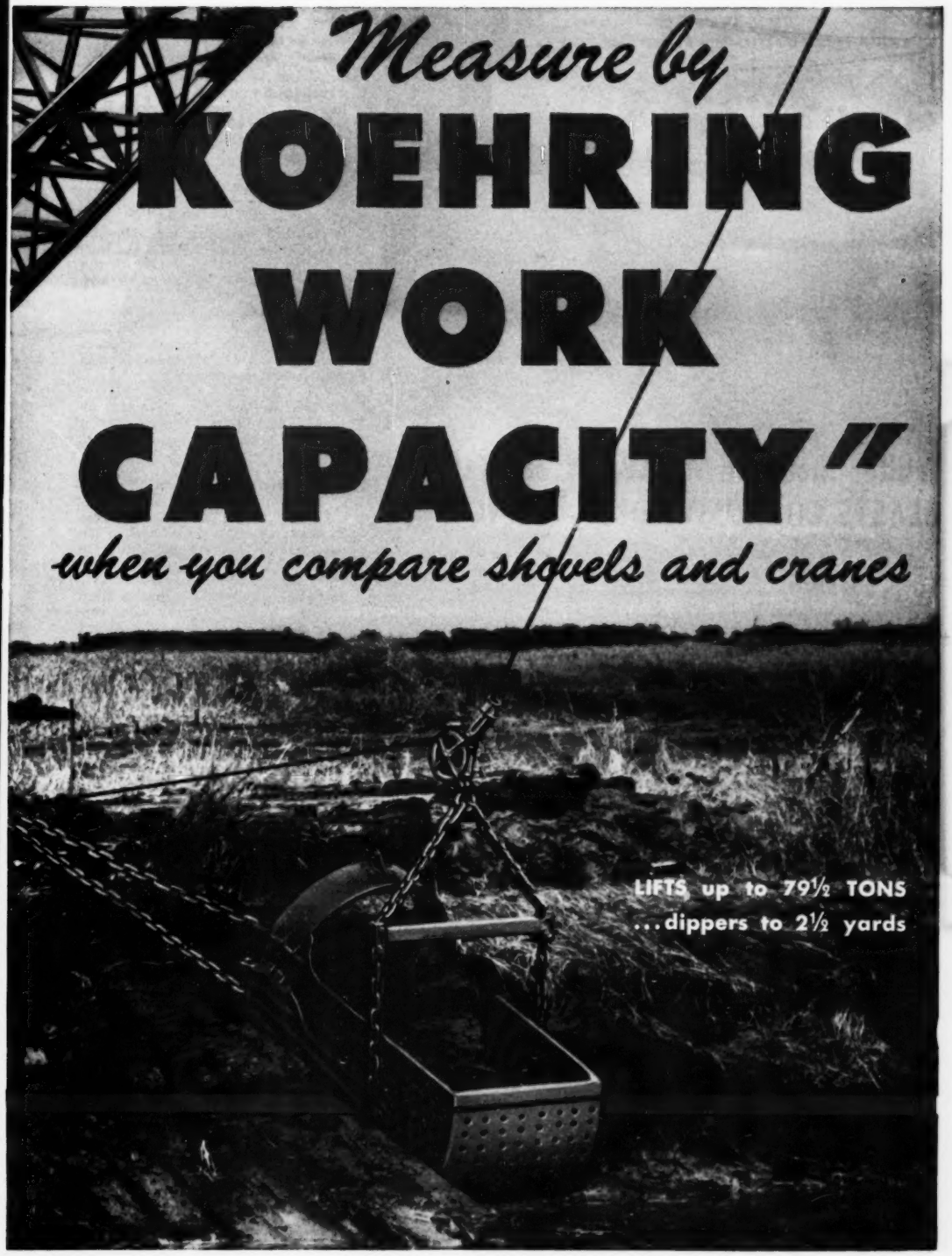


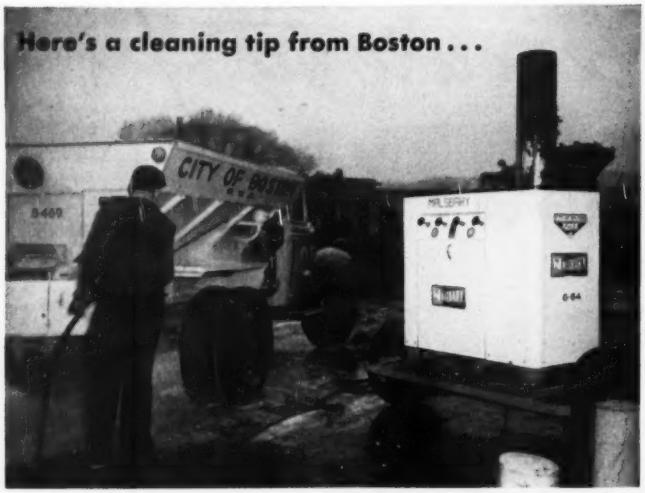
To insure lowest cost per yard moved, or ton lifted . . . compare all excavator and crane information with "KOEHRING WORK CAPACITY". Your Koehring distributor has specific figures that will let you prove for yourself the biggest profit-earning value. K124

KOEHRING HEAVY DUTY

KOEHRING COMPANY
Milwaukee 16, Wis.

Subsidiaries: PARSONS • JOHNSON • KWIK-MIX


Measure by
KOEHRING
WORK
CAPACITY"
when you compare shovels and cranes
LIFTS up to 79½ TONS
...dippers to 2½ yards



Trailer-Mounted MALSBARY 250 CLEANER BLASTS CORROSIVE DIRT . . . AND RUNS

Does your cleaner take 2 to 4 hours to steam clean a truck? Is it frequently down for repairs? Then switch to a Malsbary heavy-duty cleaner as did the City of Boston. Malsbary Model 250 (delivering hot solution at 325°F. and 200 lbs. pressure) completely removes dirt and corrosive, encrusted salt from truck shown here in 1 hour. It cleans big street sweepers in 2 hours (a 4 to 5 hour job for conventional steam vapor cleaners)—then rolls to other yards for more cleaning work. Says Boston's maintenance superintendent, "The most dependable cleaner we've ever used. Maintenance costs have been nil."

Ask for On-Job Demonstration

See for yourself how Malsbary exclusive patented pumping system delivers 2 to 4 times more pressure than steam vapor cleaners; thus enables you to do jobs with Malsbary that other cleaners can't touch. For demonstration, fill in coupon NOW. No obligation.

3 heavy-duty models — 250, 300, 500. Oil or gas fired; gas engine or electric drive; stationary, portable or trailer mount. All develop hot solution in 2 to 3 minutes.

MALSBARY MANUFACTURING CO. SINCE 1923

Room C5, 845 92nd Ave., Oakland 3, Calif.

28

I AM INTERESTED IN—

- ☐ On-the-job demonstration.
- ☐ Free booklets on MALSBARY Cleaners.
- ☐ "How To Make Efficient Use of Steam Cleaning" reprint.

NAME POSITION

BUSINESS

ADDRESS

SALES AND SERVICE . . .

Continued from page 141

N. Albina Ave., Portland, Ore., Construction Equipment Co., 1118 W. Ide Ave., Spokane, Wash.; and Bow Lake Equipment Co., 300 Michigan St., Seattle. Universal's Pacific Coast office and warehouse is located in San Leandro, Calif.

On the Sales Front

Raybestos-Manhattan, Inc., Manhattan Rubber Div.: Harold H. Burrows becomes sales manager of the Industrial Rubber Goods Sales Division.

Jackson Manufacturing Co.: Paul D. Kistler has been appointed sales manager. Glenn A. Bucher becomes assistant sales manager.

Unistrut Products Co.: Cornelius Elsasser, Jr., is the new eastern district manager with offices in Irvington, N. J.

Marion Power Shovel Co.: Maurice V. Cornell has been named vice-president in charge of sales. David E. Rizor was named assistant to the president in matters pertaining to sales and service.

Long-Bell Lumber Co.: Charles Munger, Jr., becomes factory sales representative in the eastern seaboard territory.

Pioneer Engineering Works, Inc.,; Earl A. Lerner has been appointed western mines representative for the southwestern states. Export sales now are being handled by the Domestic Sales Department under K. E. Brunsdale, first vice-president and Carl R. Rolf, vice-president and sales manager.

The Celotex Corp.: A. L. (Dick) Dent becomes manager of the company's Atlanta sales branch. R. C. (Bob) Moore is assistant manager.

Austin-Western Co.: Don J. Phillips has been appointed sales manager and J. Arthur Fitzenz becomes assistant sales manager. Robert H. (Bob) Diller is the new assistant advertising and sales promotion manager.

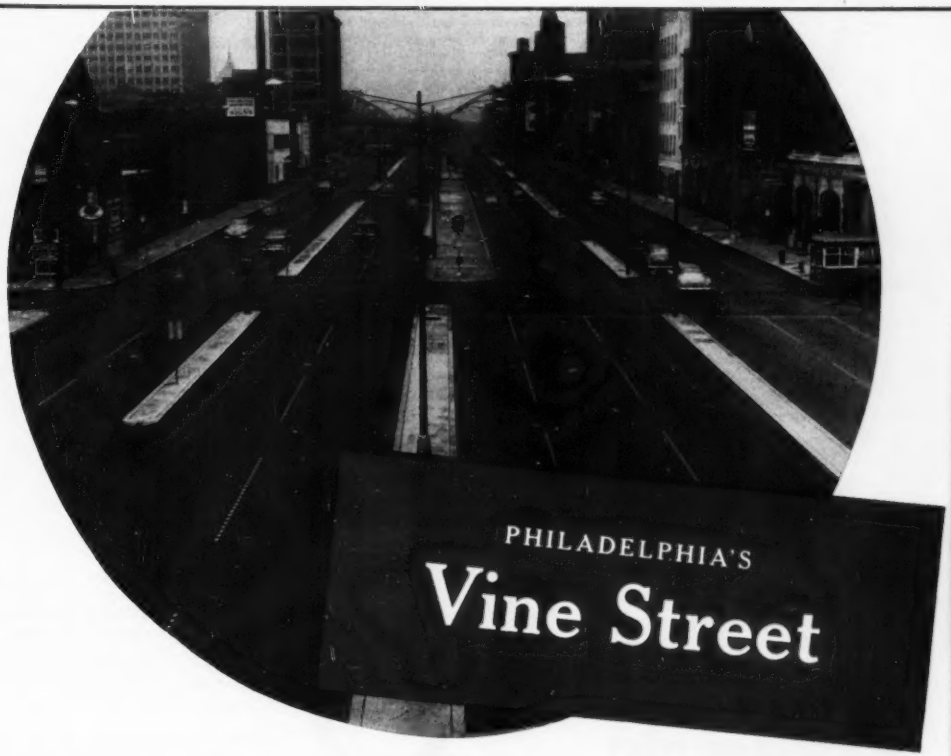
Cleaver-Brooks Co.: Harold F. Holtz has been named sales manager of the Boiler Division.

Drill Bit & Tool Co.: Edward L. Fish and Robert B. Crawford have been named national sales representatives responsible for the marketing of Midland Throwaway rock bits to mining, quarry, construction and other heavy industries.

Chain Belt Co.: W. A. Clayton has

(Continued on page 146)

Another major U. S. thoroughfare *is paved with* Texaco Asphalt



View of the resilient, heavy-duty Texaco Sheet Asphalt pavement constructed on Vine Street by the Union Paving Company of Philadelphia.

Faithfully yours
50 TEXACO
for Fifty Years

This multi-lane thoroughfare is one of the principal traffic arteries of the country's third largest city. Chief reason for its importance is that it serves traffic bound to and from the Delaware River Bridge, which links Philadelphia with Camden, N.J. More than 250,000 vehicles crossed this bridge during a three-day weekend.

The pavement which serves Vine Street traffic is resilient, heavy-duty Sheet Asphalt. Texaco Asphalt was used in the Vine Street pavement—also in the Asphaltic Concrete and Sheet Asphalt paving on the Delaware River Bridge itself.

In Philadelphia and 1500 other representative U.S. communities, Texaco Asphalt paving has demonstrated over and over again its rugged durability and low upkeep cost.

For helpful information on the various types of Asphalt construction suitable for streets, highways and airports, write our nearest office for copies of two booklets on the subject, which will be sent without cost or obligation.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

TEXACO
U.S.A.

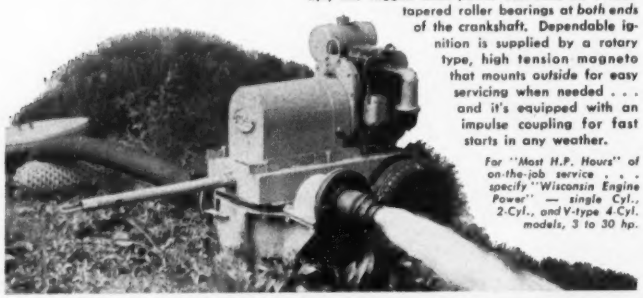
TEXACO ASPHALT

POWER TO FIT THE MACHINE
POWER TO FIT THE JOB

WISCONSIN-POWERED Rex Pump

Designed to meet de-watering requirements in which large amounts of solid materials are present, this 4" Closed Diaphragm Rex Pump will handle up to 6,000 gals. per hr. on a 10-ft. suction lift. It's built by Chain Belt Co., Milwaukee, and powered by Model AKN 4-cycle single cylinder Wisconsin AIR-COOLED Engine, turning up 3¾ hp. at 2100 rpm.

Like all Wisconsin Air-Cooled Engines, from 3 to 30 hp., this rugged little power unit runs on Timken tapered roller bearings at *both ends* of the crankshaft. Dependable ignition is supplied by a rotary type, high tension magneto that mounts *outside* for easy servicing when needed . . . and it's equipped with an impulse coupling for fast starts in any weather.



For "Most H.P. Hours" of on-the-job service . . . specify "Wisconsin Engine Power" — single Cyl., 2-Cyl., and V-type 4-Cyl. models, 3 to 30 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on
Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division
PHOENIX PRODUCTS COMPANY
4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

SALES AND SERVICE . . .

Continued from page 144

been made sales manager of the Construction Machinery Division.

Independent Pneumatic Tool Co.: Arthur H. Nelson becomes manager of electric tool sales in the Thor portable tool line in the Chicago branch.

Euclid Road Machinery Co.: John E. Ehlert becomes assistant domestic sales manager. G. M. Perry steps up to become service manager, and George W. Cunnan is the new district manager for the Northeast territory.

A. C. Horn Co., Inc.: Norman D. Nichols has been appointed field sales supervisor and will act as a consultant and technical adviser in aiding the sales staff.

Pittsburgh Corning Corp.: Harry W. Bennett becomes district manager in the Chicago office for the sale of Foamglas and glass blocks. C. P. Barrett has been appointed eastern manager of Industrial Insulation Sales, is located in New York.

In the Main Office

Timken Roller Bearing Co.; R. H. Holsing has been promoted to assistant chief engineer of the company's Rock Bit Division.

Cummins Engine Co., Inc.: Three of the company's officers have been elected to the Cummins board of directors. They are L. W. Beck, vice-president, sales; D. J. Cummins, vice-president, engineering; and W. M. Harrison, vice-president and treasurer.

Pioneer Engineering Work, Inc.: D. J. Ellertson, vice-president, has been placed in charge of all manufacturing and procurement operations for Pioneer.

Marion Power Shovel Co.: New officers elected are John P. Courtright, president and general manager; J. Malcolm Strelitz, chairman of the board; Adrien F. Busick, Jr., vice-president in charge of engineering. Officers reelected are Alex Gibson, vice-president and treasurer; Merle Virden, secretary and assistant treasurer; and Walter C. Kraft and Newton B. Schott, assistant secretaries.

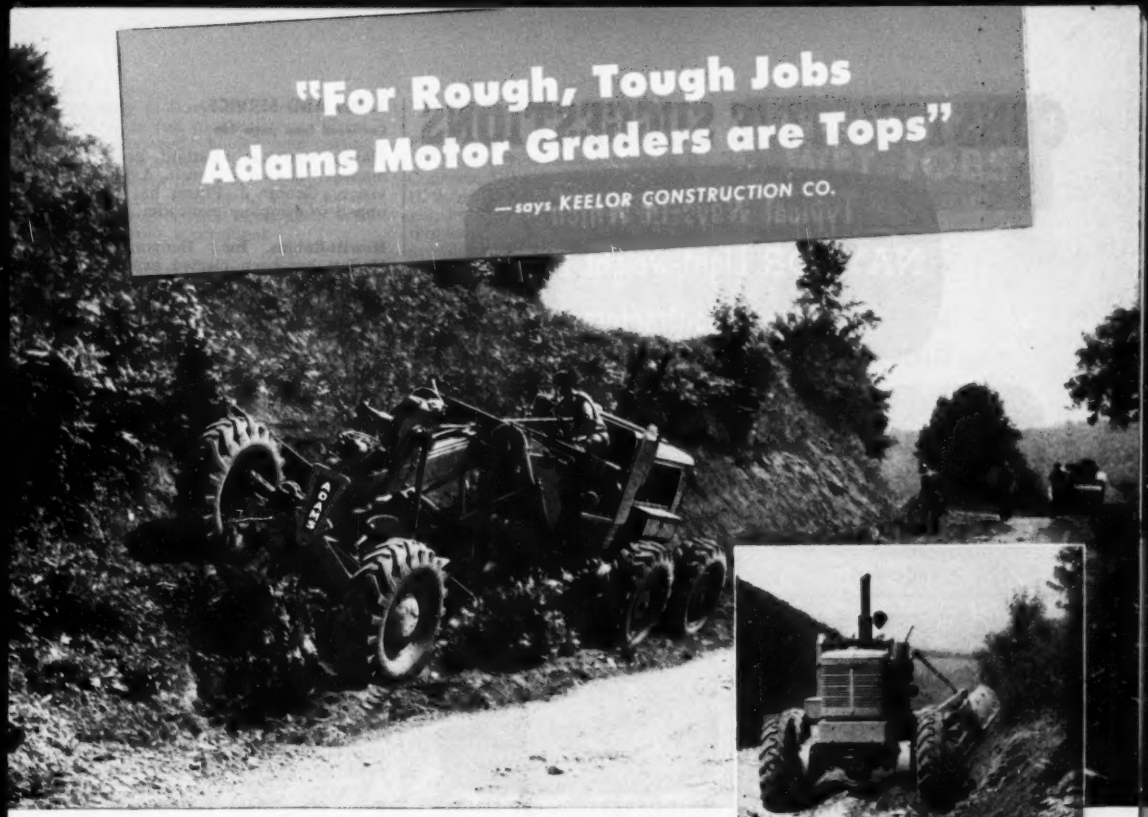
Quaker Rubber Corp., (Div. of H. K. Porter Co., Inc.): George A. Dauphinais has been elected vice-president and general manager—will be in charge of manufacturing and sales activities.

Timken-Detroit Axle Co.: Frederick W. Parker, Jr., has been appointed executive vice-president. Louis C.

(Continued on page 148)

"For Rough, Tough Jobs Adams Motor Graders are Tops"

—says KEELOR CONSTRUCTION CO.



On the job pictured above, a 100 hp. Adams Motor Grader is helping to grade, widen and resurface 8 miles of road in the rock area of Pennsylvania—than which there is none rougher or tougher.

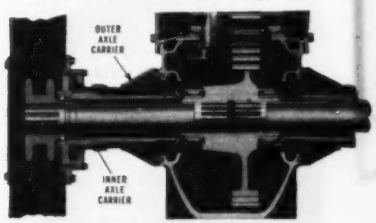
Keelor Construction Company, owner of this machine, says, "We consider Adams the best motor grader on the market, as evidenced by our recent purchase of another one of these big machines. Not only does its 100 hp. high-torque diesel engine have the lugging ability to handle roughest, toughest work, the whole machine has exceptional strength and stamina."

Performance like this is typical of all Adams Motor Graders, making them first choice of more and more contractors and highway officials. All models—from largest to smallest—offer such important advantages as *8 Overlapping Forward Speeds* • *High Arch Front Axle* • *Positive Mechanical Controls* • *Wide Range of Blade Adjustments* • and many others.

Ask your local Adams dealer to demonstrate how these great machines will step up operations and cut costs—*for you*!

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

ADAMS FULL-FLOATING REAR AXLE



In all Adams Motor Graders rear-end weight is borne entirely by heavy inner and outer axle carriers. The axle serves only to drive the machine—is not subject to the shocks and stresses that cause most axle failures in other graders.

Make your next motor grader an

ADAMS

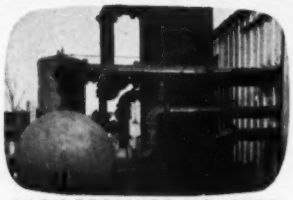
CONSTRUCTIVE SUGGESTIONS

Typical Ways in Which NAYLOR Light-weight PIPE Serves Contractors

DREDGING

WATER LINES

VENTILATING PIPE

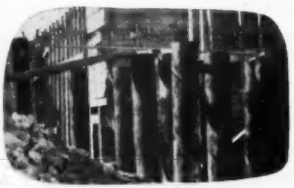


HIGH PRESSURE AIR LINES

HYDRAULICKING

DE-WATERING LINES

SAND AND GRAVEL CONVEYING



COMPOSITE PILING

Write for Naylor Bulletin No. 507

NAYLOR PIPE

Naylor Pipe Company
1268 E. 92nd St., Chicago 19, Ill.
New York Office:
350 Madison Ave., New York 17, N.Y.

SALES AND SERVICE . . .

Continued from page 146

Haltug becomes asisstant general manager of the Wisconsin Axle Division. George J. Finzel has been upped to company controller.

Hewitt-Robins, Inc.: Benjamin J. Moffatt has been elected executive vice-president, with three divisional general managers responsible to him. Harold Von Thaden continues as vice-president and becomes general manager of the International Division, in addition to the Robins Engineers Division—which he has headed for several years. Austin Goodyear is the new general manager of the Hewitt Rubber and Robins Conveyors Divisions. Robert A. Nilsen becomes general manager of the Restfoam Division.

Link-Belt Co.: Robert C. Becherer, former executive vice-president, was elected to the board of directors and then immediately named president.

Thermoid Co.: Three assistant vice-presidents have been added. They are Fred Matheis, assistant sales manager of the Industrial Rubber Division; Alvan Campbell, Jr., production planning manager and service manager of the Special Sales Division; and Tharon J. Ellis, factory superintendent of the Rubber Division.

Twin Disc Clutch Co.: Donald E. Beaton becomes assistant general manager of the Hydraulic Division at Rockford, Ill.

Chain Belt Co.: B. F. Devine, vice-president, becomes a staff officer and will serve in an advisory and consulting capacity. A. K. Thomas is the new manager of the Construction Machinery Division. J. W. Lendved has been appointed director of engineering, Construction Machinery Division. W. J. Sparling now is vice-president and manager of Milwaukee Operations, responsible for the three major Milwaukee divisions: Construction Machinery, Chain and Power Transimssion and Conveyor and Process Equipment. M. G. Jewett becomes manager of the Chain and Power Transmission Division. W. C. Messinger, manager of the Ordnance Division, was elected assistant secretary.

Special Mention

Meili-Blumberg Corp.: Has acquired the Frank G. Hough Co. line of tractor sweepers and will distribute, as well as manufacture them under the M-B trademark. Included are pull-type sweepers, universal sweepers and tractor-mounted front-end sweepers. No changes in the distribution setup are expected.

Bucyrus Steel Products: Organized

recently in Bucyrus, Ohio, this firm now is in full production on "Precision Punched" blades and cutting edges for motor graders, bulldozers, maintainers and snow plows. Firm guarantees each blade to fit as accurately as original equipment. Arno W McGraw is president.

Allis-Chalmers Manufacturing Co.: W. A. Roberts, president, was one of seven recipients of Horatio Alger awards for 1952—given to men who have risen in the American tradition from humble beginnings to heights of achievement and service. Roberts was born on a small Ozark farm and educated himself.

Association Activities

Portland Cement Association: Douglas McHenry, formerly head of the Concrete Laboratory Section of the U. S. Bureau of Reclamation in Denver, has been appointed administrative assistant to A. Allan Bates, vice-president for research and development.

American Society of Photogrammetry: This 100-year-old society of 2,600 members elected as its three principal officers, George D. Whitmore, president; Alfred O. Quinn, 1st vice-president; and Ford Bartlett, 2nd vice-president.

TEN SECOND ACTION

MORSE-STARRETT WIRE ROPE CUTTER

SEE YOUR DEALER OR WRITE DEPT. "B"

MORSE-STARRETT PRODUCTS COMPANY

1204 - 49th AVENUE, OAKLAND 1, CALIFORNIA

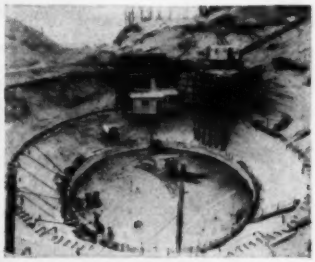
HOW TO HANDLE WET JOBS

#5 of a Series

PUMPING STATION

City of Grand Rapids, Michigan

Contr.: Owen-Ames-Kimball



DRIED FAST; NO SHEETING SILT PROBLEM OVERCOME

IN ONE MONTH from installation, the concrete base slab (4 ft thick, 71 ft diameter) was completed—deep down at 35 ft below water level. Half month more finished monolithic circular wall, 40 ft high.

Such were the speeds and savings made possible by Griffin Wellpoint equipment, plus Griffin's long-acquired "know how," which assured correct wellpoint depths, spacings and jetting methods, on this tough-to-handle job.

• Despite 4 ft layer of fine sand and silt, pre-drainage was so thorough that bulldozer could work "on bottom" feeding to crane on trestle. Excavation was open cut, with one-on-one slope. Any wonder this contractor (who had previously tried Griffin "quick-dry" service) came back for a "second helping!"

GRIFFIN WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

You'll have the right to be as proud as those two young bucks in the photo — if you can correctly name this model 1908 pioneer truck! This one-cylinder, ¾ ton "pay load" job could carry those bales of hay at 10 m.p.h.—which was really traveling, compared to what a horse could do. Write us for the name of this truck to make sure you are right.

PERFECTION

One of the First and Foremost Builders of BODIES and HOISTS

In the days when this "old timer" photo was taken, the mule and horse were valiantly trying to keep pace with the growing competition of the motor truck. But by the close of the first World War they were practically out of the transportation picture.

Then the need for job-engineered Bodies and Hoists to augment the speed and power of the motor truck quickly put PERFECTION prominently on the map. And the consistently high quality of PERFECTION design and construction has kept them there as a dependable source of supply and a valuable source of help on Truck Body and Hoist problems.

For interesting literature — Write Dept. M-52.

Big pay-load dump bodies are a specialty with PERFECTION today. Photo shows one of these giants—a type 354 Body of 17 cu. yds. capacity, mounted with a patented No. 1027 Iso-Draulic ROLL-A-LIFT.

PERFECTION TRUCK BODIES and HYDRAULIC HOISTS

FOR ANY TRUCK
STANDARD or SPECIAL UNITS IN ALL SIZES • FOR ANY USE

Engineered, Manufactured, and Guaranteed by
THE PERFECTION STEEL BODY COMPANY . . . . . Galion, Ohio, U. S. A.

Some Things Are WORSE THAN STRIKES

This editorial which appears in McGraw-Hill publications was written just prior to the resignation of Charles E. Wilson as Director of Mobilization. The principle it discusses is of basic and continuing importance in our struggle to maintain economic and personal freedom in America.

It is to be hoped that the managements of the steel industry will resolutely resist the efforts of the national Wage Stabilization Board to force them to establish the union shop in their plants. In essence, the union shop means compulsory union membership.

They should resist not because of any financial advantage to the owners of the industry. There would be none. They should resist out of a decent regard for those ideals of our country which we are now fighting in Korea to protect. Moreover, their resistance would, as a matter of fact, benefit the leaders of the organized steel workers by protecting them from the certain and bitter fruits of their "victory" in getting the government to impose the union shop on the steel industry. Their successful resistance would also prevent Premier Stalin and his co-workers from enjoying a hearty laugh at our expense.

Fun for the Russians

This is why the Politburo would find the establishment of the union shop in the steel industry, at the behest of the Wage Stabilization Board, so profoundly amusing. We are fighting in Korea because we believe that armed aggression, promoted by Russia, menaces our freedom. And we are spending hundreds of billions of dollars here at home for armament to protect our freedom at other danger points. When this rearmament program is threatened by a crippling strike, the federal government through its Wage Stabilization Board proposes to buy off the threat by plowing under a vital element of that freedom which we are trying so desperately to preserve.

When the union shop is adopted through voluntary agreement, as it has been in cases covering millions of workers, it deeply undercuts the freedom of the individual. To hold his job he is required to join the union and support it financially whether he wants to or not. In the case of such voluntary agreement, however, the government takes no direct part in thus destroying the freedom of its citizens. It is essentially a private transaction.

Tyranny is the Word

But in the steel case the federal government becomes a party to a direct attempt to impose the union shop. Instead of protecting its citizens in their right to earn a livelihood, the government forces certain of them to join and support a private organization which they have clearly indicated they do not want to join. This they must do to hold their jobs. Tyranny is the accepted designation of government coercion of this kind.

It may be objected that the Wage Stabilization Board merely recommends the union shop, does not order it. This was also true of the action recently taken by a President's Emergency Board, which also "recommended" that working agreements between the

(Continued on next page)

railroads and about a million non-operating railroad employees include a provision for the union shop. A government recommendation, however, can easily be given much of the force of an order, particularly by the calling of a strike to "uphold the hand of the government."

It seems entirely clear that in trying to impose the union shop on the steel industry the Wage Stabilization Board has completely lost its bearings. It was set up to handle labor problems to tide over an emergency. Now it comes up with a revolutionary modification of labor relations in the steel industry which, if adopted, would become a permanent part of the institutional machinery of the industry.

"Too Much Like Hitler"

Early in World War II an effort was made to have the federal government order the union shop for a group of organized coal miners. President Franklin D. Roosevelt, who will go down in history as one of organized labor's greatest champions, blocked it. "That," he said, "would be too much like the Hitler methods toward labor." But now, with supreme irony, the federal government fosters this Hitlerlike method toward labor ostensibly to advance our conflict with Stalin.

In persuading the Wage Stabilization Board to sponsor the union shop for steel workers, there is every reason to believe that the union leaders have trapped themselves. If the government imposes the union shop, a next step clearly becomes necessary. This is government regulation of the union in order to provide a modicum of protection for the minority that would be forced by the government to join against their will. It could be that for a time the government would ignore this obligation. But, having granted the union the power to eliminate the minority, it would sooner or later be forced to regulate the use of that power. Thus free collective bargaining and freedom itself would be the losers.

An Issue of Basic Principle

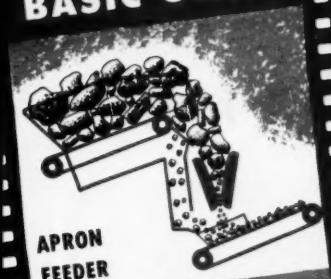
Resistance to a government-sponsored union shop for the steel industry is bound to bring harsh denunciation both from the administration and union leaders who have teamed to back it. Not only does the union shop relieve the union leaders of the problem of recruiting members, it also eliminates a group of workers that they stigmatize as "free riders"—namely, those who work for companies which have a working agreement with a union but do not join the union. In the basic steel industry about 10 per cent of those who work for companies with union agreements are not members of the union. Such a small percentage of non-members is obviously no threat to the "security" of the union, although that is what the drive for the union shop ostensibly is designed to protect.

In the reporting of the present labor dispute in the steel industry virtually all of the attention has been focussed on the handling of the issue of a wage increase and how large it should be. This, to be sure, is vitally important. Mobilization Director Wilson has said it is "a serious threat to our year-old effort to stabilize the economy." But certainly of comparable importance is the tremendous issue of principle raised by the government's backing of the union shop for the steel industry.

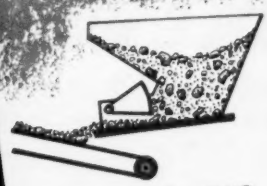
If the position of the Wage Stabilization Board on the union shop prevails, our government will have blunted the arms we are forging to fight for our freedom abroad by undermining a major bulwark of our freedom right here at home. At this critical time in the struggle to preserve and protect our freedom such a subversive course should be resisted to the limit.

McGraw-Hill Publishing Company, Inc.

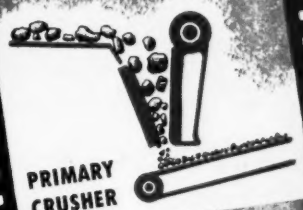
BASIC UNITS



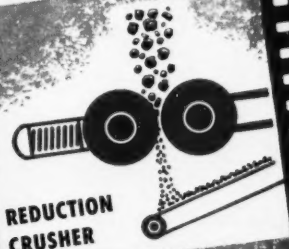
APRON FEEDER



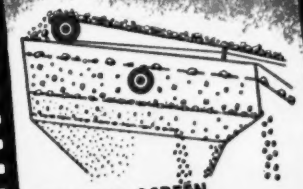
RECIPROCATING FEEDER



PRIMARY CRUSHER



REDUCTION CRUSHER



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30 minutes of action, in 16 mm. color and sound, picturing portable and stationary crushing and washing plants, and the basic units of which they are composed. Your nearby A-W distributor will be glad to arrange a showing for you.

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History-Making Tracto-Shovel

Thousands of Allis-Chalmers HD-5G 1-yd. front-end shovels are making history . . . handling an endless variety of excavating and material handling jobs faster, at lower cost than ever before.

Now . . . to meet the challenge of ever-increasing production demands, Allis-Chalmers *multiplies the scope of tractor usefulness even more.* And here's how.

The same basic design — the same versatility that made the HD-5G so useful can now be yours in 2-yd., 3-yd., and 4-yd. Tracto-Shovels. Combined with the unmatched performance of the new Allis-Chalmers tractors, they give you a real competitive advantage by bringing you a new, faster and better way of getting the job done.

A NEW ERA OF TRACTOR USEFULNESS

Pioneering New Methods — Tracto-Shovels are blazing new trails in excavating and material handling . . . doing traditional jobs in a new, better way.

A Size for Every Job — Faster, more efficient operation; at lower equipment investment.

All-'Round Versatility — Not limited to a specific type of operation. Quickly interchangeable attachments adapt Tracto-Shovels to different assignments *in minutes.* Simple truck or trailer transportation between jobs.

Built to Take It — These new Tracto-Shovels are the toughest, strongest ever built. Every part has ample size and strength to do its job.

14 different attachments

Standard buckets, heavy-duty rock buckets, rock forks, bulldozer blades, light materials buckets (up to 7 cu. yd.) . . . plus other attachments for some models.

1 yd. HD-5G	2 yd.* HD-9G	3 yd.* HD-15G	4 yd.* HD-20G
40 Drawbar hp.	72 Drawbar hp.	109 Drawbar hp.	Hydraulic torque converter drive
Dumping height (bucket hinge pin): 9 ft., ⅛ in.	Dumping height (bucket hinge pin): 11 ft., 4 in.	Dumping height (bucket hinge pin): 12 ft., 8 in.	175 net engine hp.
Total weight: 16,200 lb.	Total weight: 29,900 lb.	Total weight: 40,000 lb.	Dumping height (bucket hinge pin): 13 ft., 5 in.
			Total weight: 61,600 lb.

Advantages*

NOW IN 3 NEW, BIGGER SIZES!

World's Largest Front-End Shovel — handles toughest excavating and materials handling jobs in a new, faster, better way. Standard bucket capacity — 4 yd.; light materials capacity — 7 yd.

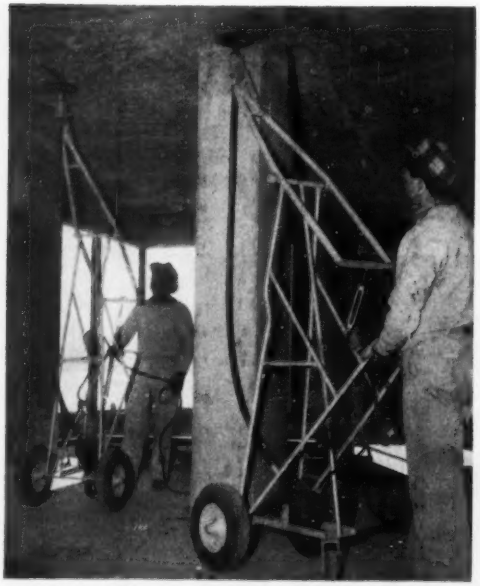
the newest, finest line on Earth!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

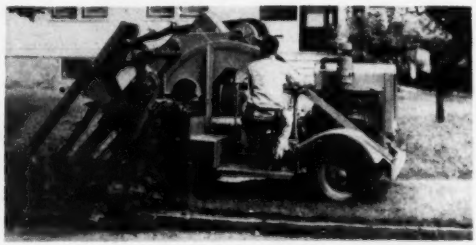
CONSTRUCTION EQUIPMENT NEWS . . A Preview of

JAMES M. CONNOLLY, Equipment Editor



RUBBING CEILINGS EASY JOB FOR "GIRAFFE"
All the inconveniences and bother connected with rubbing concrete ceilings can be forgotten once you use this new versatile machine known as the Giraffe. Its fully adjustable grinding head removes fins, ribs and board marks; does away with the need for scaffolds, planks, horses, as well as goggles and gloves. Adjusts to ceilings 7 to 9 ft high. For sale or rent from **Concrete Grinding Corp., Dept. M, 300 Straight St., Paterson, N. J.**

2C500 HEILINER AVAILABLE COMMERCIALLY
Built exclusively for the last year for the Corps of Engineers, the 2C500 Heiliner is now available commercially. It features a 13-yd scraper, loaded speeds to 25 mph, Hydro-Steer, synchronized air brakes on tractor and scraper.—**The Heil Co., Milwaukee 1, Wis.**



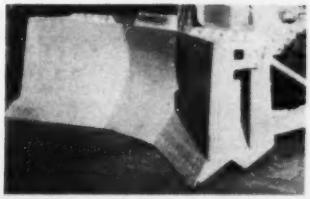
TRENCHLINER NOW RIDES ON RUBBER TIRES
Take a Trenchliner, equip it with rubber tires and what do you have? Answer: A Trenchmobile. The Model 88 rig digs to depths of 5 ft in 8- or 12-in. widths. Gas-engine-powered, it has variable speed selection for bucket line, conveyor belt, travel and digging traction. Tires permit work on sidewalks, driveways and even lawns. Belt is reversible; main shaft has anti-friction bearings.—**Parsons Co., Newton, Iowa.**

THERMOSETTING PLASTIC PIPE IS GLASS-FIBER REINFORCED
The pipe you see here is thermosetting, not thermo-plastic, a kind that shatters easily and melts at elevated temperatures. It's impervious to corrosion, 1/5 the weight of steel and can stand working pressures of 200 psi. On the other hand, it can be bent readily. Two diameters are available, 3½ and 4½ in. Fibers can be controlled for extra bursting or beam strength.—**Perrault Brothers Plastic Pipe Division, Tulsa, Okla.**

PORTABLE SCYTHE FOR GRASS
This new portable, power-driven scythe cuts and trims grass and weeds in inaccessible places. Known as a Scythette, it weighs only 24 lb, yet cuts a 20-in. swath.—**Hoffco, Inc., 409 N. 8th St., Richmond, Ind.**

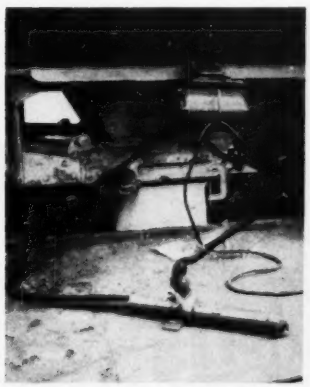
New Machinery, Tools and Equipment That Will Help You on the Job

ONE-MAN OR TWO-MAN LIGHTWEIGHT PORTABLE CHAIN SAWS This 5-hp, two-man chain saw is the lightweight Reed-Prentice No. 50. Its fast-cutting planer-chain can rip or crosscut with equal ease, and an amazingly small amount of filing is said to keep it trim. A standard float-type carburetor remains in upright position always, even though engine and cutting attachment swivel through a full 360 deg, and lock at any angle for felling, bucking or under-cutting. An automatic clutch stops the chain when engine idles. All blade lengths for 1- or 2-man operation are interchangeable.—**Reed-Prentice Corp., Worcester 4, Mass.**



ANGLE WING FOR ALL DOZERS Although it's mounted here on the front of a Caterpillar D6, the Shepherd angle-wing attachment is available for all makes and types. With all the advantages of a U-type, it is recommended for side casting, backfilling and pioneering hillside cuts by using a single wing.—**Shepherd Tractor & Equipment Co., Los Angeles 22, Calif.**

BIGGEST FRONT-END LOADER With 1¼-yd bucket and 66.5 engine hp, this big shovel-type loader is equipped with torque converter and weighs 13,700 lb. Like all Trojan Loadsters, this model LC-100-B loads over the drive wheel, providing constant traction.—**Contractors Machinery Co., Batavia, N. Y.**



VIBRATOR UNLOADS RAILCARS The hydraulic push-pull jack on this Topdog vibrator clamps on any steel channel of a railroad hopper car for quick unloading.—**Vibro-Plus Products, Inc., 54-11 Queens Blvd., Woodside, L. I., N. Y.**

SMALL TRACTOR CONVEYOR HANDLES MYRIAD OF JOBS After years of building conveyors for many and varied requirements, this manufacturer now comes up with the Con-Vay-It No. 12-30. It has been used successfully to carry mortar, bricks, cement and a host of other items; also wet concrete for slabs, foundations and walls. No cleats are used since it was found that concrete and grout adhered and set up on them.

(Continued on next page)

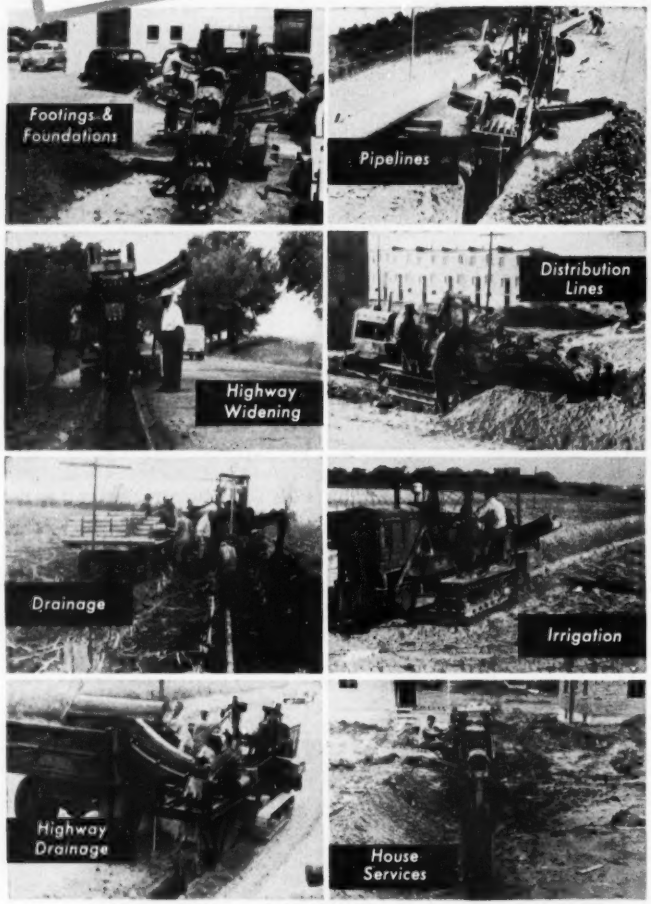
CLEVELAND

No specialist—but a

Performance-Proved

EXPERT

on all types of trenching jobs



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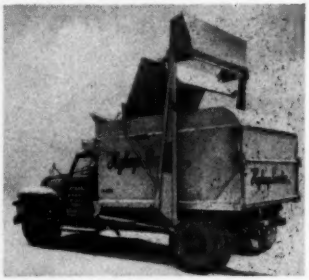
CONSTRUCTION EQUIPMENT NEWS

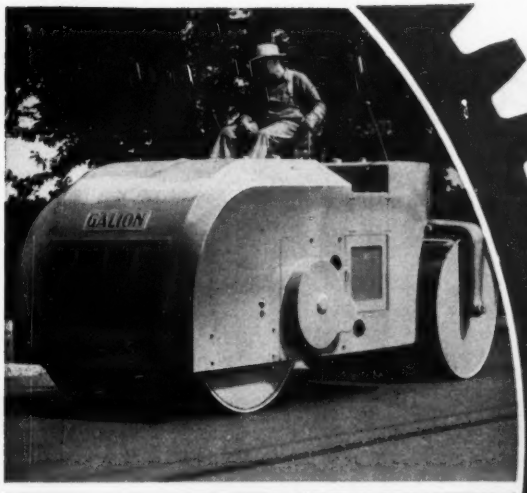
. . . Continued

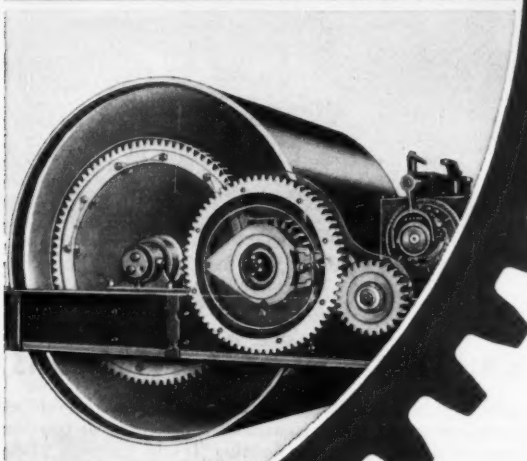
Rubber, wood or plastic scrapers are used instead of steel to minimize wear on the belt. Numerous wash-out holes are provided for cleaning. It will move wet concrete at the rate of 1 to 3 cu yd per min and has been carefully designed to prevent segregation of concrete.—**American Conveyor Co., 1115 W. Adams St., Chicago 7, Ill.**



HIGH-SPEED LOADER—Another addition to the line of materials handling equipment is the Hykap Loader, adjustable to any size dump truck. Once the loader is mounted on the rear of the truck body and hydraulic system tied in with a power takeoff, all operations can be controlled by the driver from his seat up top. Two levers are located there, one to raise and lower the arms, the other to open and shut the shovel. From his perch the driver can operate the bucket and drive the vehicle in any direction, (with attachment of a four-fingered device on the steering wheel). First of a line of attachments is the bucket

which will hold a yard of loose material and has been tested to 4,400 lb. Also available is a 29-in. magnet operated by a 5-kw generator (bottom photo), and chain attachments for hooking to shop-box containers. Any of these attachments can be disconnected or hooked up in a few minutes. Loading is always done over the rear, eliminating danger of falling materials injuring the cab or driver.—**Efficient Equipment, Inc., 1621 W. Hastings St., Chicago 8, Ill.**





YOUR GOOD MECHANICAL JUDGMENT

will recognize the following features of Galion Tandem Roller Final Drive as sound, performance-proved, time-tested engineering.

- GALION FINAL DRIVE GEARS are all *Spur Gears.*
- GALION FINAL DRIVE is a 2 step gear reduction train thru 4 spur gears — a straight-line drive.
- GALION FINAL DRIVE greatest gear ratio is only 5 to 1.
- GALION FINAL DRIVE spur gears are special alloy steel, accurately machine cut and heat-treated. No ordinary, uncut, cast gears are used.
- GALION FINAL DRIVE has *no small beveled pinion gear driving a large bevel ring gear* on the roll.

IF YOU KNOW YOUR GEAR MECHANICS

you know that *gradual* reduction and low speeds (each gear with roller bearings) plus a straight-line spur gear train, give the least friction and consequently have the least gear wear. That is why Galion Final Drive gears *stay in line,* wear the least, and consequently last longest without adjustment or replacement.

REMEMBER! ROLLER *RELIABILITY*— depends largely on its FINAL DRIVE mechanism

SPUR GEAR GALION FINAL DRIVE

TANDEM ROLLERS

THE GALION IRON WORKS & MFG. CO.

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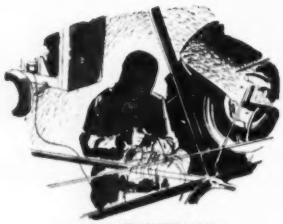
NEW! light, compact, D-C field

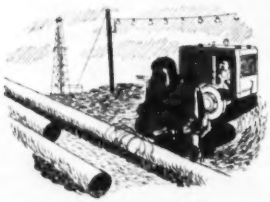
ENGINE-DRIVEN WELDER

with A-C power take-off



FIELD MAINTENANCE

FARM AUXILIARY POWER



PIPELINE CONSTRUCTION

A UNIT WITH MANY APPLICATIONS!

The new Westinghouse Engine-Driven Welder was developed for construction and field-maintenance operations. It provides 200 amperes of d-c current for welding. It also provides 3,000-watt, 110-volt, a-c current for stand-by power. By simply plugging into convenient receptacles on the a-c power panel, the operator may obtain power for drills, grinders, pumps, lights and other electrical equipment.

The standard unit is skid mounted for truck transport or may be mounted on a high-speed, pneumatic-tired trailer. Ready for field service, the unit weighs only 1,150 pounds and measures 39½″ high by 62⅛″ long in the stationary model.

The standard model has hand-crank start. Battery start is also available.

A large toolbox for storing cables, helmets, electrodes, tools and other accessories is also included if desired.

FOR MORE INFORMATION

Write to the Westinghouse Electric Corporation, Welding Division, Buffalo, New York, or contact your nearest Westinghouse representative.

J-21611

welder PLUS stand-by power!

LOOK AT THESE FEATURES!

1 CONVENIENT A-C POWER TAKE-OFF

3 kw stand-by power can be obtained without using a bulky, auxiliary rotating machine. The operator simply plugs into one of the convenient 110-volt, a-c receptacles. This stand-by power is extremely beneficial when ordinary sources of power are not available.

2 IMPROVED WELDING GENERATOR

Closely coupled to the driving engine, this new improved generator makes it easier to strike and maintain a steady welding arc. No exciter is required. Welding current ranges from 40 amperes at 20-load volts to 250 amperes at 40-load volts.

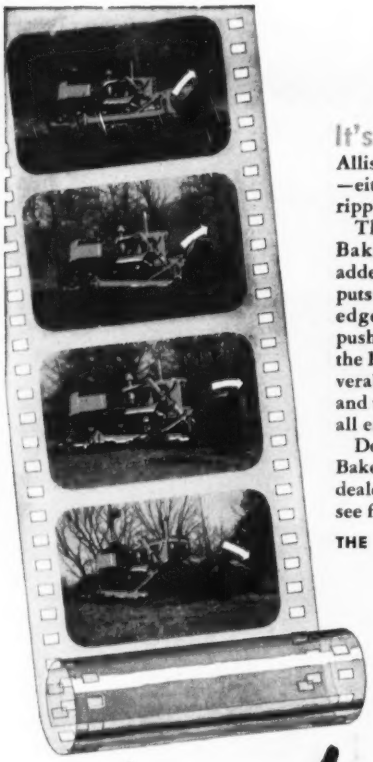
3 EFFICIENT, RELIABLE ENGINE

The new welder is equipped with a performance-proved, 4-cylinder, liquid cooled, Ford industrial engine. It is rated 30 maximum and 25 continuous horsepower at 1,800 rpm. The engine is equipped with oil filter and oil-bath air cleaner.

YOU CAN BE SURE...IF IT'S Westinghouse

WESTINGHOUSE

WELDING EQUIPMENT



It's easy dozing with Baker, Allis-Chalmers matched equipment—either for dozing, gradebuilding or ripping roots and rocks.

The "move-more-dirt" curve of Baker's famous involute blades, added to the design feature which puts the tractor weight on the cutting edge, leaves maximum power for push. These Baker features help make the Baker, A-C team the most maneuverable—the most easily operated, and thus by far the most *productive* of all earth moving equipment.

Don't settle for anything less than Baker, A-C! See your Baker, A-C dealer. Get on the bandwagon and see for yourself—

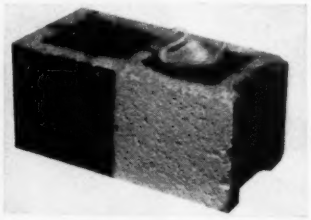
THE BAKER MANUFACTURING CO.
Springfield, Illinois

Wherever you see the Baker, A-C team at work, you see action like that pictured above, in photos of a conservation job near Lanark, Illinois. It's an Allis-Chalmers HD-9 with Baker Bulldozer.

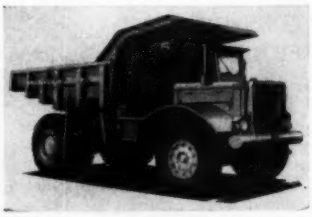
Thar she rolls!

P. S. Have you seen the new 9-X no push beam dozer?

PLASTER MIXER—A new plaster and mortar mixer of 6-cu-ft capacity, known as "Model 80", was recently announced. Among the improved new features is the Muller Everlasting Shaft Seal which is said to replace the conventional stuffing boxes and packing. This new seal also reduces friction loss and alleviates wear on the paddle shaft. Power is optional with 4.5-hp or 7.7-hp Briggs and Stratton air-cooled engines or a 3-hp electric motor.—**Muller Machinery Co., Inc., Metuchen, N. J.**



ONE-COAT MASONRY SEALER—The manufacturer of Bloc-Seal, a one-coat oil-base masonry seal shows here a graphic demonstration of his product by painting a cement block, sealing its bottom, filling it with water and floating a toy duck on the water. The new paint can be applied above or below grade, exterior and/or interior, depending on conditions. It's applicable direct-from-the-can, and no sizing operation is needed. One gallon is said to cover 100 to 250 sq ft, depending on porosity and surface irregularities. It's available in seven pastel colors including white, buff, gray, ivory, pale green, brick red, etc. from **The Surface Protection Co., Inc., 16801-C Euclid Ave., Cleveland 12, Ohio.**



OFFSET CAB ON DUMP-TRUCK—Production of the new heavy-duty end-dump Earth-Mover No. 801 has begun at the Seattle plant of Kenworth Motor Truck Corp. Rated 9.9 cu yd struck and 11.9 heaped, its payload capacity is 15 tons. It sports anti-friction powered steering, minimum turning radius and wide-axle track. The offset cab provides maximum visibility fore and aft. Power is supplied by a Cummins NHBID-600, developing 220 hp at 2,100 rpm; 535-lb-ft torque at 1,400 rpm; with 743-cu-in. piston displacement.—**Kenworth Motor Truck Corp., Seattle 11, Wash.**

PORTABLE IMPACT WRENCH—A Thor ⅜-in. portable impact wrench is available, powered by air and reversible, with the same basic impacting mechanisms as on the company's electric-powered tools. Key feature is an exclusive rolling ball-type cam which increases efficiency and steady functioning of the impacting mechanism. The new wrench is available with two types of spindles—a size 24 with ½-in. square drive, and a size 24S with 7/16-in. hex quick-change chuck, integral with the spindle. Equipped with convenient side handle and trigger-type throttle, the new wrench weighs only 5¾ lb and is 8 11/16 in. long. A handy reversing valve is on the back for tightening or loosening operations.—**Independent Pneumatic Tool Co., 175 N. State St., Aurora, Ill.**

DOPE KETTLE—Large-capacity dope kettle features double agitation with a marine-type propeller and a slow-speed bottom sweep. Another improvement is the combustion chamber which has a double gas pass for bottom protection and fuel

(Continued on page 165)

"Sizing up" the capacity of a paver or mixer could prove a hazardous shot in the dark. THAT IS—UNLESS IT'S A. G. C. RATED! The A.G.C. Rating Plate is an absolute guarantee that rigid requirements of drum size and mixing capacity have been met. Whether you are a contractor, architect or engineer—the A. G. C. Rating Plate is your protection. Look for it.

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY Milwaukee, Wis.	THE JAEGER MACHINE CO. Columbus, Ohio	KWIK-MIX COMPANY Port Washington, Wis.
CONSTRUCTION MACHINERY CO. Waterloo, Iowa	THE KNICKERBOCKER CO. Jackson, Mich.	THE T. L. SMITH COMPANY Milwaukee, Wis.
THE FOOTE CO., INC. Nunda, N. Y.	KOEHRING COMPANY Milwaukee, Wis.	WORTHINGTON PUMP AND MACHINERY CORP. Construction Equip. Div., Dunellen, N. J.

Increase your profits and eliminate losses by controlling costs. Today's cost-conscious contractor and engineer, small operator or large, will find this comprehensive handbook provides the answers to construction accounting and cost control problems common to all. Prepared under the auspices of the American Society of Civil Engineers, it is written by men who are active in and really know construction.

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Well illustrated and supported by charts and specimen accounting forms, this authoritative 97-page, 8½ x 11, sturdily bound book covers the complete cycle of estimating, accounting, distributing and analyzing of all operational and overhead costs. A practical and easily applied system is fully outlined. Included are sections on:

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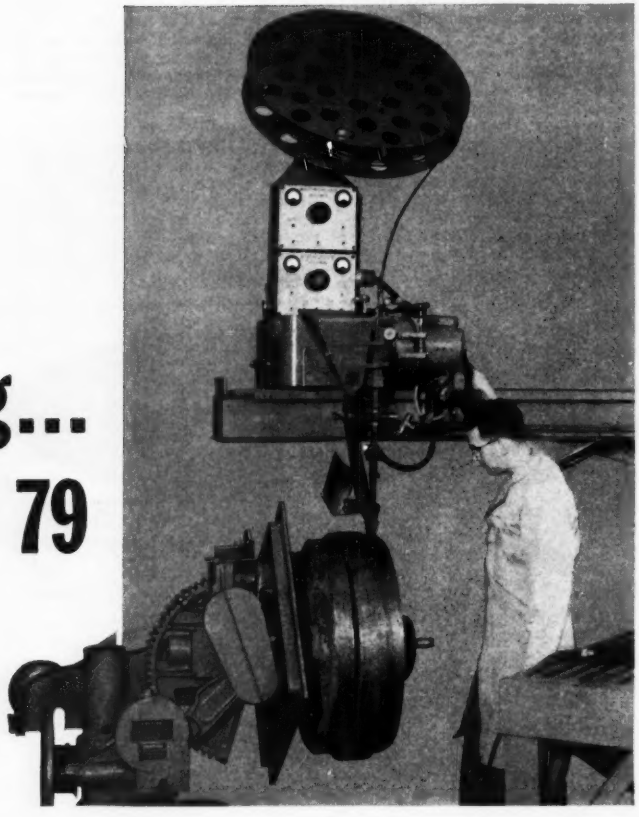
Announcing... Amsco AW 79



for AUTOMATIC HARDFACING

AMSCO AW 79 will meet your every requirement for better control of wear where abrasion and high impact are important factors—plus giving you all the advantages of automatic welding. It can be used for reclaiming parts worn to uselessness or for increasing productivity of new parts.

The result of extensive research and field testing, AMSCO AW 79 is especially suitable for rebuilding and hardfacing tractor rollers and idlers. Back-up rolls, steel wheels, sheeting rolls, dredge pins, as well as dozens of other applications, can be successfully hardfaced with AW 79. It can be used on any conventional automatic submerged arc welding equipment now being used.

AW 79, the first in a series of rods by AMSCO for automatic hardfacing, is an alloy steel electrode fabricated by encasing particles of alloy metals in a continuous steel tube. Deposits are of martensitic alloy steel with chromium and molybdenum as the principal alloying agents. It is available in coils weighing approximately 100 lbs., each with an inside coil diameter of 22½", and is stocked in wire diameters of 5/32" and 3/16". Packed in cardboard containers with an anti-rust agent, other coil diameters and sizes are available on request. Write today for complete information.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

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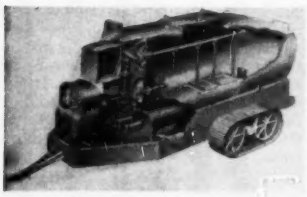

(Continued from page 163)

economy. In independent lab tests under operating conditions, only a 5% differental existed between top and bottom of the kettle. Samples of mix to determine distribution of the filler showed only a 1% differential. A 2-in. thickness of rock wool provides insulation on all exposed areas. During tests, high temperatures have been maintained on a full night holdover, and a simple plug-type, draw-off valve, kept warm by a hot dope jacket has been installed to prevent freezing during shut-down periods. This valve is rugged enough to shut off completely regardless of the passage of foreign matter. The C-R-C "SP" kettle has a 27-bbl capacity and weighs 17,020 lb with tracks. Another welcome feature is the elimination of unpleasant de-coking. A heavy-duty hydraulic cylinder actuates the bottom sweep, and its continuous travel across the bottom prevents the formation of coke.— **Crutcher-Rolfs-Cummings, Inc., Houston, Tex.**

HARDBOARD PANEL—A light-density ¼-in. hardboard panel called Thriftwood has been designed for general interior use such as wallboard, underlayment and cabinet work. It's an all-wood panel of Doug has fir fibers which are refined, treated and welded together under heat and pressure. It has enough strength and stiffness for interior wall construction or industrial or fabrication work, and it's easily sawed, nailed, glued or planed. Other advantages are easy finishing, hard-wearing surface and ease of application. Standard panel sizes are 4x4, 4x6 and 4x8 ft. Available through Forest Hardboard distributors. — **Forest Fiber Products Co., 316-14 Pacific Bldg., Portland 4, Ore.**

CARBURETOR CLEANER—GUMOUT cleans carburetors on the engine with a forced-flow process in less than 20 min. Using a special applicator called the Gumouter, GUMOUT enters the carburetor through the gasoline intake. The solution flows through all gasoline and air jets, passages, screens and vents of the carburetor; dissolves and removes, by chemical cleaning action, gum sludge, muck, moisture and lacquer deposits from all internal carburetor parts. Diesel GUMOUT is a special

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FUNK

Heavy-Duty

CLUTCHES, and POWER UNIT DRIVES

Here is the low-cost solution for keeping old equipment on the job. Repower, using FUNK Take-Offs and Clutches. Available in a wide variety of types to fit most requirements for shaft speed and installation space. Designed to fit any standard SAE flywheel housing or Ford Industrial Engine. Write for specifications, or assistance on your power problem.

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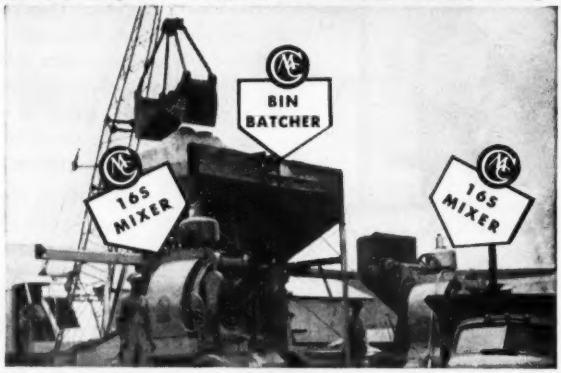
3303 Airport Drive, Coffeyville, Kansas

You can't beat this combination



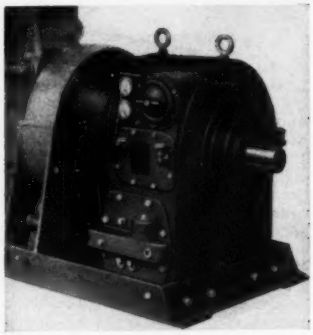
It's double speed ahead now!

Here's a *portable* Central Plant that amazingly reduces pouring costs. It's CMC 165 mixers in *tandem* with CMC *two-bin* BIN-BATCHER. When you buy select CMC equipment you get the *best*. Every piece of CMC equipment is *built to take the punishment of long service!* Write today for latest catalog.

CONSTRUCTION MACHINERY CO.
WATERLOO, IOWA, U.S.A.

MIXERS—PUMPS—HOISTS—SAWS
DUMPOVER PARTS

product for use in diesel engines and oil heating equipment. One pint should be added to the fuel tank for every 50 gal of fuel. For cleaning oil heating equipment, one pint is sufficient when added to every 100 gal of fuel oil.—**Pennsylvania Refining Co., 2686 Lisbon Rd., Cleveland 4, Ohio.**



THREE-ELEMENT TORQUE CONVERTER—Latest addition to the Torcon torque converter line is Model 17-K, a single-stage, three-element type unit that combines a converter and fluid coupling in the same housing. It's rated to provide automatic power transmission for heavy equipment including logging machinery, materials handling devices, shovels and cranes. It has variable torque ratio up to 3:1. At zero output speed the torque multiplication is highest, gradually decreasing as output speeds increase, until output and input are equal. When torque ratio reaches 1:1, the reaction member is free wheeled, and the unit acts as an ordinary hydraulic coupling. In this coupling range, output speed increases in nearly direct proportion to engine speeds. It uses standard SAE 10 motor oil and incorporates built-in oil filter, temperature and pressure gages.—**The Torcon Corp., 1194 W. Fifth St., Ashtabula, Ohio.**

CHEMICAL FIRE EXTINGUISHER—This portable fire extinguisher is a pressure-operated, dry-chemical type which can be recharged easily in the field. Its design permits it to be serviced following discharge simply by pouring 5 lb of dry chemical into the powder chamber and, with the aid of a gas station or factory air line, charging the unit with 150 lb of compressed air. The rig features trigger-type finger control, and a gage is built into the handle to show exact pressure at all times. Should the gage fall below 150 psi, additional air can be added at any time to bring it up to the unit's designed operating pressure. The portable weighs only 10 lb fully loaded, stands 15 in. high and is 4½ in. in diameter.—**Walter Kidde & Co., Inc., 40 E. 34th St., New York 16, N. Y.**

HIGH UP

. . . on the list of "Economy Short-cuts" for the $4 Million Nassau County Sewer Expansion was . . .

FOSTER RENTAL PILING

Hendrickson Bros., Inc.

GENERAL CONTRACTORS
EXCAVATING · GRADING · HEAVY CONSTRUCTION

63 NORTH CENTRAL AVENUE
VALLEY STREAM, N. Y.

L. B. Foster Co.
11 Park Place
New York 7, N. Y.

Re: N. C. Sewage Disposal Plant

Gentlemen:

Because this job was near the ocean, we had to get Interlocking Steel Sheet Piling to hold back mud at subgrades, to assure dry working conditions. Contract requirements made time of utmost importance, so we turned to Foster for prompt delivery of just what we needed. Needless to add, your prompt delivery was taken for granted -- and furthermore we figure that we effected a considerable saving because of your low rental rates.

Yours very truly,

HENDRICKSON BROS., INC.

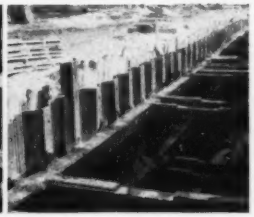
Arthur J. Hendrickson

Arthur J. Hendrickson,
President.

1,000 feet of Foster Rental Piling serviced 10,000 feet of this job for Hendrickson Bros. They rented 1,000 ft. to be driven in the relatively soft subsurface a total of ten times—piling being in place a week before pulled for re-use in advanced location. The complex piling requirements were best serviced from Foster's large rental stocks with the exact lengths and the exact sections the job required, at economical low rental rates.

Let us quote you on our low-cost piling rentals—prompt service from five Foster warehouses. Send for Free Piling Brochure illustrating diagrams of all standard-make sections, ask for Bulletin CM-5.

66-inch diameter precast conduit at an average depth of 35 ft.—placed atop a 7-inch concrete slab.



Piling holds back mud for The Sanitary Trunk Sewer conduit which ran 7 miles on Long Island's South Shore.

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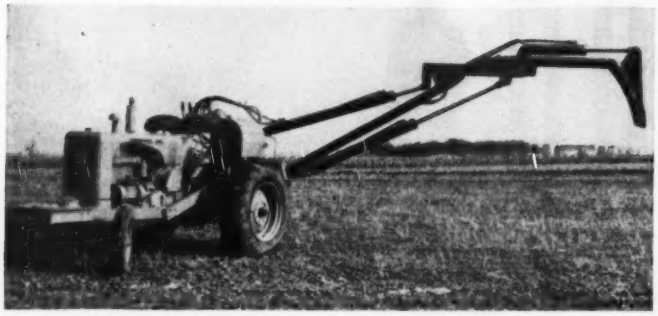

TRACTOR-MOUNTED DIGGER—Here, mounted on a Sheppard diesel SD-3 tractor, is the new HOPTO digger with an hydraulic-actuated rake attachment. The completely hydraulic rig is a big brother of the "TM" model put out last year for mounting on a standard automotive truck of 1½ tons or larger. With a normal reach of 16 ft and an extended boom reach of 19 ft, the rig will travel in a complete 180-deg swing. Operating pressure is 1,000 psi lifting capacity 2,000 lb, the latter increased greatly with the use of stabilizers. Hydraulic system is Vickers or Blackhawk, and the digging depth is 9 ft, with a bucket replacing the rake. Power is supplied through an hydraulically operated power take-off.—**Badger Machine Co., Winona, Minn.**

STIK-TACKS—Architects, engineers and draftsmen generally follow one of two methods to fasten their papers to a drawing board: They use either thumb tacks or an adhesive tape of some sort. We believe they'll discard both methods after trying Stik-tacks. These are small disks, pressure-sensitive and adhesive on both sides. They stick readily to paper, wood, tile or glass—but not to the fingers—and peel off again readily, when necessary. Almost paper thin, they leave no bulge between drawing board and paper, nor any sticky residue when removed. Handy, folding packages contain 82 or 328 Stik-tacks, as desired. Two sizes are available: ½ in. or ⅜ in. dia.—**Thompson-Winchester Co., Inc., 1299 Boylston St., (Dept. M), Boston, Mass.**

HEAT-RESISTANT LUBRICANT—Excellent performance in both extremes of heat and cold, high resistance to water and anti-corrosiveness are three advantages of a new multi-purpose industrial lubricant—Sotol—announced recently. After extensive laboratory and field tests, it has retained its lubricating powers and has not melted or run even at a temperature of 1,000 F. Sotol likewise has demonstrated virtual immunity to destructive emulsification and washing away by water and the capacity to forestall corrosion of surfaces. According to the manufacturer, Sotol lubricates moving parts adequately at low temperatures at which many lubricants are so viscous or thick that they do not adhere properly to moving parts. Accordingly, it may be applied during cold weather without heating of grease guns. Because of its high resistance to water, it is especially valuable to lubricate parts exposed to rainfall or subjected to moisture condensation. It is packed in units of 40, 110, 235 and 435 lb by **Southwestern Petroleum Co., Ft. Worth, Tex.**

From 15 to 17 inches steam space above low water level, insuring ample steam reserve for sudden excessive demand.

Used by many Road Contractors with their asphalt plant installations.

May be fired with coal, wood, gas or oil.

For easy portability, boiler can be skid mounted with built-in base for burner.

Manufactured strictly to ASME requirements in sizes 40 to 150 H.P. and pressures from 150 lbs. to 350 lbs.

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SMOKE STACKS • BREECHINGS • FLY ASH REMOVAL UNITS
ASME UNFIRED PRESSURE VESSELS

This TRIPLEX TAMPER — three CP pneumatic backfill tamper power units on a Gunderson-Taylor mounting — has 75 square inches of compaction area and enables one man to do the work of five individually operated tampers. Greater thickness of fill can be compacted to specifications; lifts can be increased as much as 20%; compactness is more uniform.

Seven different models of CP PNEUMATIC and ELECTRIC VIBRATORS enable the contractor to select the proper model for any specific job. Two-man vibrators speed the heaviest mass concrete placement. For reinforced walls, columns, floors, and similar work, there are small diameter pneumatic and electric models for one-man operation.

GET THE JOB DONE IN FEWER HOURS...

This 600 foot Diesel-driven CP PORTABLE COMPRESSOR is providing air for sheeting driving. Ranging in capacity from 60 to 600 cfm — gasoline and Diesel-driven models — there is a CP Compressor for any air requirement. Gradual speed regulator, adapting engine speed to air demands, assures economical operation and minimizes maintenance.

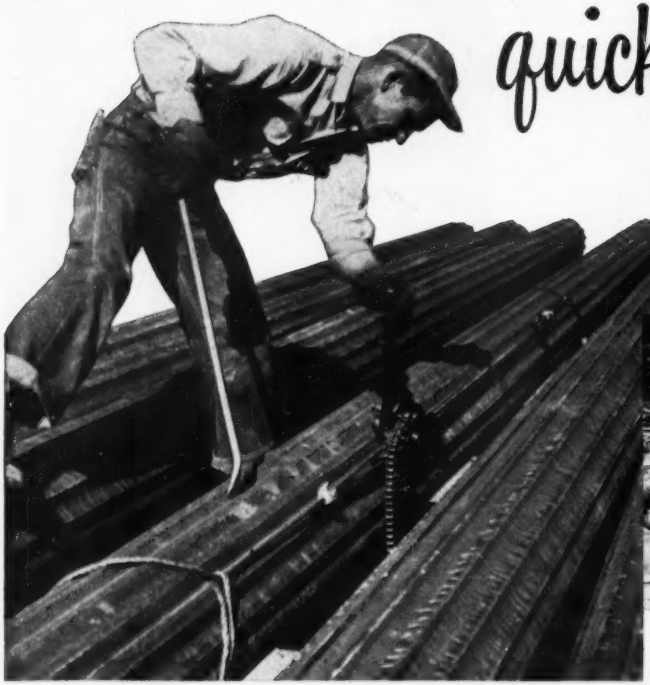
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 6 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

You can extend MONOTUBE PILES

quick and easy!

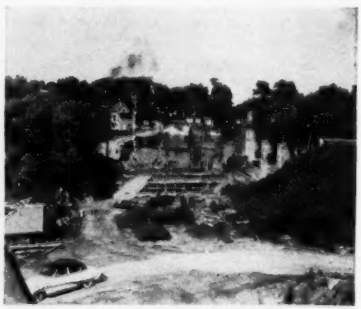


Above: Speedy nesting and welding operations on an assembly rack in the field. Tailoring piles to the required length, on the job, minimizes cut-off waste.

HERE, on a typical job, you can see the simplicity of extending Monotube piles in the field. In the photo above, a Monotube extension is being nested with a "come-along" and two cable chokers. On the same rack, as shown at right, a welder completes the job. The operation is fast . . . and sure!

There are many other Monotube advantages . . . cold-rolled strength for extra structural values . . . light weight for easier handling . . . speedier installation with light, mobile driving equipment . . . fast, easy inspection before concreting . . . simplified cut-offs with minimum waste . . . and a proven excellence in transmitting loads to penetrated soil.

Add up these important qualities and you'll see why taper-flute Monotubes are preferred by so many experience-wise engineers and contractors on foundation jobs of every description. For complete data write to The Union Metal Manufacturing Company, Canton 5, Ohio.



Overall view of foundation work for new bridge showing storage yard, pile assembly rack at left, and driving operation in background.

UNION METAL

Monotube Foundation Piles

TELESCOPING STEEL SHORE—This self-contained, telescoping steel shore is the newest in the Safway line. One man can handle it and obtain micro-adjustments. Recommended for supporting any type of form for concrete slabs, beams, columns, walls or tunnels. There's a 5-ft adjustment, and three sizes range all the way from 6 to 15½ ft. Load-carrying capacities run to 9,900 lb. A U-shaped head plate will take 4-in. or lapped 2-in. lumber on edge with no nailing required under ordinary conditions. If desired, however, nailing can be accomplished through conveniently spaced guide holes. This U-head is 8 in. long and will accept two butted timbers; a 14-incher is optional for use in beam formwork.

The insert pin, similar to that on a Lally column, makes vertical adjustments in multiples of 6 in.; final adjustment is handled through a threaded sleeve nut.—**Safway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis.**

HEATING DEVICE—A Connecticut research and development company announces a heating device which burns liquid fuel in the form of gas and is said to save 20 to 50% on household and industrial fuel bills. The heater can be installed in standard hot water and heater oil-burner tanks and can replace the present pot-type burner and gun-type atomizing oil burner. A hot-water heater using this unit burns heavier fuel more efficiently and leaves no carbon. It also requires no chimney or draft. The principle involved in both hot water and heating units is the vaporization of the liquid fuel by means of regenerated hot air. The unit generates gas from heavy liquid fuel such as kerosene, or No. 1, 2 and 3 fuel oil and is built to give the user advantages of gas combustion with the economy of fuel oil.—**Robert Reichhelm Co., Stratford, Conn.**

GALVANIZED METAL WELDS—Galvanized angle iron can be welded without losing the galvanized coating. This is accomplished by using a Heliarc torch with Everdur filler rod. The method has been accepted

ANOTHER

MAXI-MOUNTED CRANE★

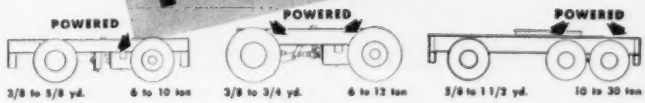
. . FOR THESE MAXIMUM ADVANTAGES:

- one-man control
- operation stability through 360°
- close quarter maneuverability
- fast travel—either direction

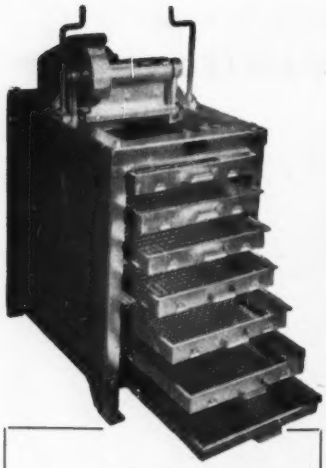
★ P & H 600 Crane, Maxi-mounted, setting steel at Las Vegas, Nevada.

MAXI CRANE CARRIERS

Write for additional information.



ENGINEERED AND MANUFACTURED BY SIX WHEELS, INC. • LOS ANGELES 54, CALIF.



REDUCE YOUR COST AND IMPROVE YOUR PRODUCT

with

GILSON *Mechanical* TESTING SCREEN

The easiest, quickest and most accurate method for cutting costs is through testing materials on the job.

The GILSON Testing Screen is designed for the efficient sizing of test samples of sand, gravel, stone, slag and similar materials. It accommodates samples up to one cubic foot, making from two to seven separations simultaneously, in five minutes or less.

The screen trays and dust pan are sturdily built to withstand rough usage—will not bend or warp. All trays and pan are balanced to the same tare weight—it is not necessary to transfer samples before weighing. Machine handles coarse or fines from 4" to 200-mesh.

Eliminate guesswork and avoid errors—get the facts—reduce operating delays—cut costs—and meet specifications with a GILSON Mechanical Testing Screen.

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GILSON SCREEN CO.
BOX 186, MERCER, PENNA.

Please send me bulletin covering details of construction and operation of GILSON TESTING SCREEN.

NAME .....

COMPANY .....

CITY ..... ZONE .....

STATE .....
C.M.&E.

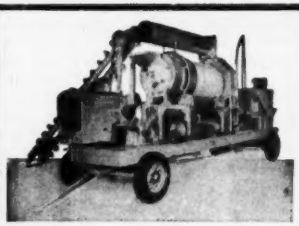
as satisfactory for air-conditioning coil support frames in the new Prudential Insurance Co. building in Houston, Tex. Previous welding jobs on galvanized iron often destroyed the corrosion-resistant coating and left unsightly welds. Grinding the weld area and redipping the entire section produced extreme distortion with subsequent straightening operations costing an estimated two or three times the cost of assembly. *As in other welding operations on zinc-coated metals, the operator in the process should be provided with adequate ventilation or approved breathing equipment.*—**The Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.**

CENTRIFUGAL PUMPS—This company has added three larger sizes to its line of self-priming centrifugal pumps. They conform to standards of the Contractor's Pump Bureau of AGC; are powered with air-cooled gas engines. The design of these larger units includes cartridge-type shaft seals, open, non-clogging impellers, hardened steel wearing plates, built-in check valves and straight-line flow of water through suction openings to the impeller. The new sizes, 20M, 30M and 40M, are available mounted on skids, on two pneumatic tires or on steel wheels. They bring the Rice line now to seven pumps, all AGC-rated, in a range of sizes from 4,000 to 40,000 gph, with electric motor drives, belted or direct connected.—**Rice Pump & Machine Co., Grafton, Wis.**

GM DIESEL ENGINE TEST KIT—Any mechanic responsible for diagnosing trouble or making preventive maintenance checks on GM diesels will be pleased with a new Kent-Moore test kit designed for this work. The kit (No. J 4209-41) includes all equipment required for checks on timing, exhaust back pressures, rpm, blower intake restriction, air box, oil crankcase pressure and cylinder liner position on series 71 and 6-110 GM diesels. Equipment is mounted in a sturdy, lightweight box and includes two U. S. pressure gages, 0 to 15 lb and 0 to 100 lb; magnehelic gage, 0 to 3,600 rpm; tachometer with flexible extensions and adapters; dial indicator with attachments; and a cylinder liner gage block.—**Kent-Moore Organization, Inc., General Motors Bldg., Detroit 2, Mich.**

TRACTOR SCRAPERS—Caterpillar has a pair of new scrapers for use with DW10 tractors, labeled the No. 10 and No. 15. With this added choice the user can match his rigs more closely to job requirements. No. 10, lighter of the two, weighs 15,440 lb and has a maximum carrying capacity of 11.5 tons; the No. 15 has a shipping weight of 17,850 lb and a

(Continued on page 175)



ASPHALT PLANTS

Complete units for maintenance and moderate contract paving. Sizes—4, 8, 15, 30 tons per hour.

Other Products

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Gasoline Engine and Electric Motor Driven Models

HEATING KETTLES
for Asphalt and Tar

AGGREGATE DRYERS
for Stone and Sand

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SPEED FORMS

Cut High Labor Costs

Make Big Savings
You Don't Have to Buy New Forms for Every Job

SPEED FORMS can be set up, stripped, cleaned, moved and reused in far less time than wood. Lightweight, easy to handle. No heavy bracing needed. No gadgets or special fastenings—Units go together with wedge clips.

Made of Steel—Good for reuse again and again on job after job indefinitely without repair. Reduce material costs way below wood—Many records of 400-500 and more uses.

Just send us plans of the job. Let us show you how to save *Real* Money on Form Work. Write Dept. CR. Ask a representative to call.

IRVINGTON FORM AND TANK CORP.
20 VESEY ST., NEW YORK 7, N. Y.

Toe holes are drilled into the base of the quarry face with wagon-mounted drills, using Bethlehem Hollow fitted with detachable bits. Note crushing and screening plant in background.

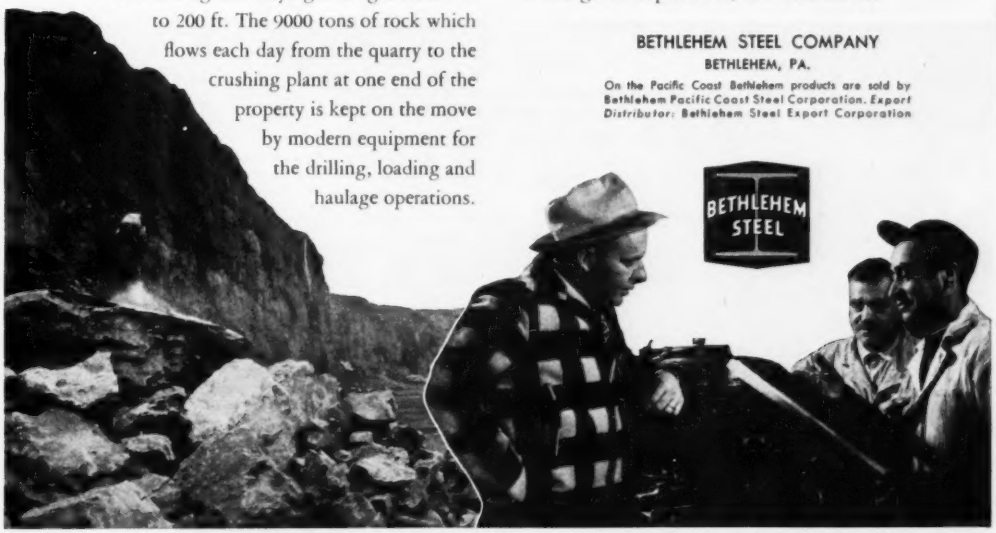
Quarry Producing 9000 Tons Trap Rock Daily Relies on Bethlehem Hollow Drill Steel

The largest quarrying operation in New Jersey is the Chimney Rock plant of the North Jersey Quarry Co., near Bound Brook. Operated on a large scale for about twenty years, the vast pit now has a working face about 1800 ft long and varying in height from 125 to 200 ft. The 9000 tons of rock which flows each day from the quarry to the crushing plant at one end of the property is kept on the move by modern equipment for the drilling, loading and haulage operations.

The rock at this quarry is a basalt, relatively difficult to drill. And like so many stone producers, this company has long relied exclusively on Bethlehem Hollow Drill Steel. Used in both wagon drills and jackhammers, it has given dependable, low-cost service.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



Blocks of trap rock which are too large for shovels to handle are drilled with jackhammers, then broken with small charges of explosive. The height of the quarry face ranges up to 200 ft.

Proper reconditioning of drill steel is an important function of the central shop operated by North Jersey Quarry Co. at Summit, N. J.

Let's get down to "brass tack" facts about

CHEVROLET

Advance-Design TRUCKS

CHEVROLET first in demand in value in sales

Fact No. 1

YOU PAY LESS TO BUY!

Get the price on the Chevrolet truck that's the right size, type and capacity for your work. You'll find that it lists for less than any other truck capable of doing the same job. Chevrolet has the lowest priced line in its field.

Fact No. 2

YOU SAVE ON COST PER MILE

You can't beat Chevrolet's Valve-in-Head engine for over-all economy—fuel, oil, upkeep. It just keeps rolling along. And extra-rugged frame, hypoid rear axle, and Flexi-Mounted cab mean longer life, lower maintenance.

Fact No. 3

YOU GET THE RIGHT TRUCK FOR THE JOB

No truck is worth the price if it doesn't get the job done—fast and sure. Chevrolet trucks are *factory-matched* to the payload, *factory-matched* to the job. There's a standard body and chassis, or chassis for special body, that's just right for your work.

Fact No. 4

YOUR TRUCK INVESTMENT IS SAFER!

Comes time to trade in an old Chevrolet truck for a new one, here's good news: Year after year, used Chevrolet trucks traditionally bring more money compared to what they cost, than other makes. The demand is there, because Chevrolet trucks stand up better.

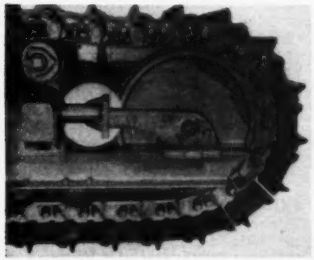
CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

(Continued from page 172)

17-ton maximum carry. Struck capacities are 7 and 10 cu yd and heaped capacities 9 and 13 cu yd respectively. Sideboards are recommended for increased payloads, provided material does not exceed 2,800 lb/yd. Basic design is similar, both having a flat, double-bottom bowl of high-tensile steel. A stinger blade with reversible cutting edge is standard equipment; air brakes and tractor brakes are synchronized.—**Caterpillar Tractor Co., Peoria, Ill.**



HYDRAULIC TRACK ADJUSTER—The attachment shown here is a hydraulic track adjuster available for all models of Caterpillar, Allis-Chalmers and International crawler tractors, called the Hydrajuster. A few shots from a grease gun take up slack, eliminating bolt and nut adjustments. Field tested in over 500 installations during the past 18 months, the Hydrajuster usually pays for itself in six months in time saving alone. Once the tracks have been broken it takes about 1½ hr for installation, approximately the same time needed for full adjustment and checkup with the old method.—**Machinery Parts Sales Corp., P. O. Box 7682, Dallas, Tex.**

MULTI - STAGE CENTRIFUGAL PUMP—Dayton multi-stage electric pump, for use in both deep and shallow wells, makes use of the axial-flow principle and is claimed to be up to 20% more efficient than pumps of similar horsepower. Design engineers also specified multi-stage diffusers of brass or steel instead of the customary iron castings. Since all water passages are smooth, friction loss is reduced and water-per-horsepower increased. Separate castings for impeller housings have been eliminated. The steel pump case is a one-piece affair, and the pump includes an adapter flange for suction and drive lines which makes it easier to hook up. To be known as the Rapidayton Super Multi-Stage Vertical Pump, models for deep wells (up to 200 ft) will be equipped with jet assemblies and with standard N.E.M.A. motors from ½ to 2 hp. Shallow well pumps will be available with ¾- to 2-hp standard motors.—**Dayton Pump & Mfg. Co., Dayton, Ohio**

Make Costly Manhours More Productive with Mall *Portable* Power Tools

Less sweat, less muscle, less end-of-the-shift fatigue but more work done — all this adds up to keeping the job on schedule and netting a better return on your contract when Mall Power Tools take over the hard work. Men like the "feel" of these husky, dependable tools and the contractor likes the low-cost maintenance and high scoring heavy-duty service — backed by over 30 years' experience in tool design, production and field testing.

MALL VIBRATORS — Mall concrete vibrators produce better finished concrete at minimum cost. Pneumatic, electric or gasoline engine models. Write for Bulletin 2022.

MALL CHAIN SAWS — Dependable cutting power for hard, soft, wet, dry or frozen wood. Pneumatic, electric or gasoline engine types. 12" to 144" capacity. Write for Bulletin 2066.

MALL DRILLS — Mall Drills have perfect balance, are built for years of service. Pneumatic or electric power. Capacities ¼" to 1¼". Write for Bulletin 2073.

40 Factory-Owned Service Warehouses, Coast to Coast, To Serve Our Customers and Thousands of Dealers

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You're sure to win with these easy-wheeling Sterling barrows. Why? Because Sterlings are made to outlast any barrow on the market. Sterlings are engineered and built to take hard punishment, over a long period of years. That's why they cost less. Get the facts. Write for Catalog No. 61.

STERLING CSW

Maximum capacity 5 cu. ft. 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

Choice of wood handles or tubular steel frame . . . steel wheel or pneumatic tired wheel.

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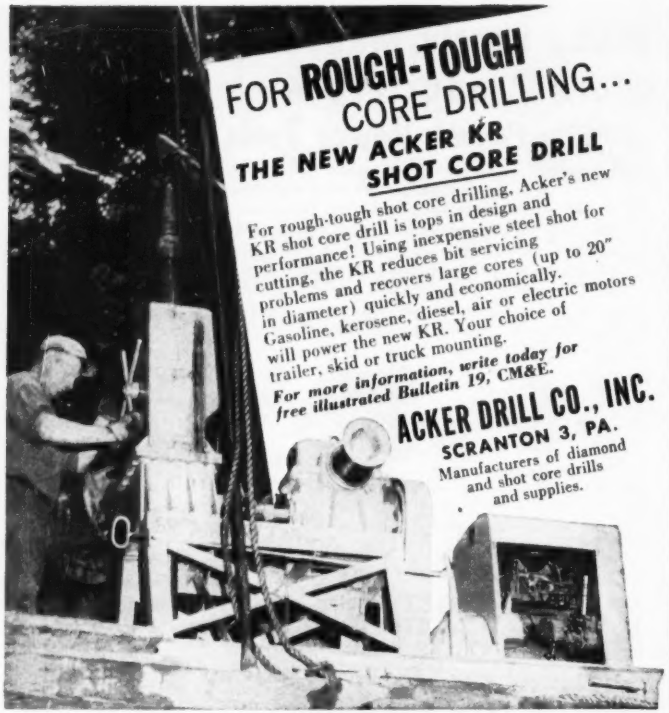
Look for this Mark of STERLING Quality

Sterling S WHEELBARROWS


FOR ROUGH-TOUGH
CORE DRILLING...
THE NEW ACKER KR
SHOT CORE DRILL
For rough-tough shot core drilling, Acker's new KR shot core drill is tops in design and performance! Using inexpensive steel shot for cutting, the KR reduces bit servicing problems and recovers large cores (up to 20" in diameter) quickly and economically. Gasoline, kerosene, diesel, air or electric motors will power the new KR. Your choice of trailer, skid or truck mounting.
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Manufacturers of diamond and shot core drills and supplies.

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/8" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

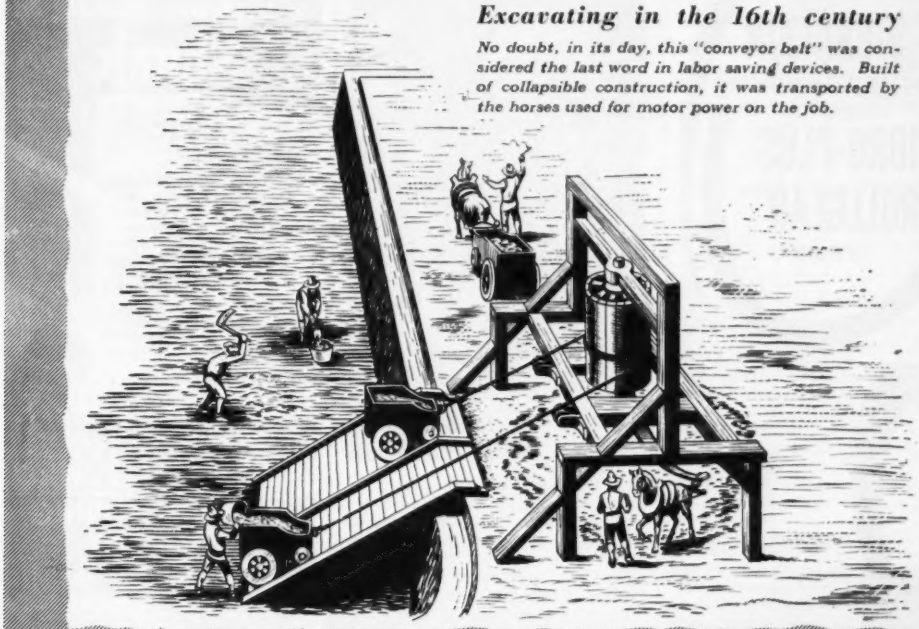
INDUSTRIAL ENGINES—Three new heavy-duty industrial engines are being produced by the Ford Motor Co. These units, equipped with overhead valves, bring to six the number of engines specially built by this company for industrial applications. Also available is a Multa-Torque converter which offers all the advantages of a fluid coupling plus torque multiplication. It is designed to absorb shock overloads, prevent stalling under excess loads and start bigger loads faster. The "317" is a V-8 engine rated at 140 bhp, 2,800 rpm; the "279", also a V-8, is rated at 125 bhp at 2,800 rpm; the "215" is a 6-cylinder engine rated at 93 hbp at 2,800 rpm. (The numbers identifying each engine correspond to its cu-in. displacement.) The Multa-Torque converter is for use with the 215, as well as the 239 and 254 engines, also manufactured by **Ford Motor Co., Dearborn, Mich.**

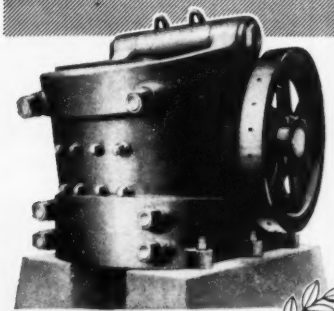
COLD SOLDER — No-Torch cold solder is a powdered aluminum in a quick-drying semi-fluid state for application with a putty knife or by brushing or spraying when thinned with a solvent supplied by the company. The vehicle evaporates, leaving deposited aluminum in a smooth surface that is said not to track, chip, peel or shrink. It adheres to all metals and wood, is available from **A. L. Okun Co., 148-26 58th Ave., Flushing 55, N. Y.**

LEAD LUBRICANT—Lead has been regarded as a fine lubricant, but its use in metallic form has been prevented by the lack of a successful method to keep it from settling out of suspension. Now a heavy-duty grease lubricant, known as LEAD-LUBE, is available. It's a homogeneous blend and fills a definite need among lubricants. The function of metallic lead in LEAD-LUBE is to form self-lubricating surfaces over all the wearing parts of gears and bearings, so that wearing surfaces will get added protection. In the case of older equipment, the metallic lead will resurface pits and scores and restore a higher degree of efficiency. At the beginning of its 5-yr research program, the maker supplied it to more than 100 diversified companies all over the country and kept a record of specific experiences to aid in further development. Widespread use of LEAD-LUBE awaited final development of the company's homogenizing process, since in early experiments, too high a percentage of the metallic lead settled out of suspension, particularly where long periods of time elapsed between uses of the lubricant. This problem finally was solved through advances in powder metallurgy which now make metallic lead available in what is literally dust form. **—Knapp Mills, Inc., 23-15 Borden Ave., Long Island City 1, N. Y.**

Excavating in the 16th century

No doubt, in its day, this "conveyor belt" was considered the last word in labor saving devices. Built of collapsible construction, it was transported by the horses used for motor power on the job.





The curved jaw plates of a Traylor "R" Jaw Crusher will insure better, more uniform aggregate on your next construction project . . . at less cost per ton. Bulletin 1123 gives details.

Methods, as well as equipment, become obsolete over the years as new techniques are developed. Today, the old idea of hauling aggregate for miles is giving way to the more efficient method of producing it on the job. For 50 years, Traylor has made a habit of foreseeing new ways to do work more efficiently. Consequently, Traylor machinery has always been the favorite of progressive engineers who know the value of a reservoir of experience and know-how. Traylor has experience . . . half a century of it.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

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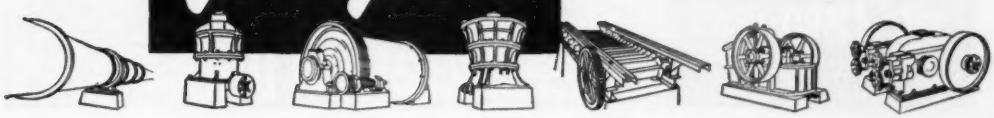
467 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • Los Angeles
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

a **Traylor** *leads to greater profits*

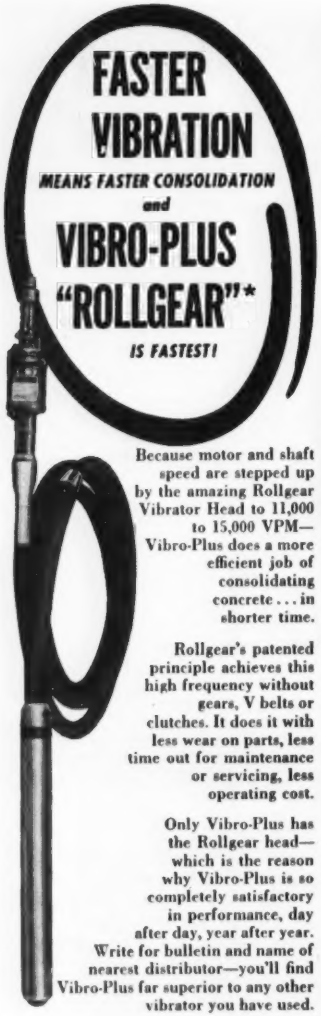


FASTER VIBRATION

MEANS FASTER CONSOLIDATION and

VIBRO-PLUS "ROLLGEAR"*

IS FASTEST!



Because motor and shaft speed are stepped up by the amazing Rollgear Vibrator Head to 11,000 to 15,000 VPM—Vibro-Plus does a more efficient job of consolidating concrete . . . in shorter time.

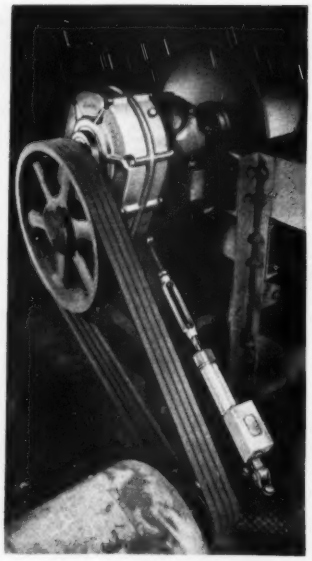
Rollgear's patented principle achieves this high frequency without gears, V belts or clutches. It does it with less wear on parts, less time out for maintenance or servicing, less operating cost.

Only Vibro-Plus has the Rollgear head—which is the reason why Vibro-Plus is so completely satisfactory in performance, day after day, year after year. Write for bulletin and name of nearest distributor—you'll find Vibro-Plus far superior to any other vibrator you have used.

TYPE PRSB, PNEUMATICALLY OPERATED. *Recommended where electric power is not available, or gasoline engines are impractical. Available with vibrator head of 1¾", 2 3/16" or 2¾" diameter. Shaft and head may be used with gas or electric motors when desired. Comes with standard flexible shaft of 20 or 30 ft. Grinding attachments available.*

*Reg. U. S. Pat. Off.

VIBRO-PLUS PRODUCTS, INC.
54-11 Queens Blvd., Woodside, L. I.



SPEED REDUCER—The speed reducer shown here is a double-reduction, shaft-mounted affair with capacity to 243 hp and output speeds from 12 to 110 rpm. The No. 7 brings to eleven the number of sizes in the Dodge Torque-Arm line. They're divided in two series, single- and double-reduction, with capacities from 1 to 43 hp and output speeds from 12 to 330 rpm. In the accompanying photo, it's shown mounted on the shaft of a solid steel head pulley on a belt conveyor, complete with a Tri-Matic overload release. In the event of overload, the anchoring arm release trips, loosens belts, cuts off power and gives an alarm.—**Dodge Mfg. Co., Mishawaka, Ind.**

BRITISH DIESEL STARTING SYSTEM—Here's an ingeniously simple compressed air-powered apparatus that offers many advantages over conventional mechanical methods of starting medium-sized diesel engines. The complete unit consists of an engine-driven compressor, an air storage tank, a distributor and a series of injector valves, one mounted on each of the cylinders. From the tank a feed pipe passes through a master on-off cock to a T-junction, the crosspiece of which continues as the main air trunk to the cylinder head injector valves while the right-angled branch (in smaller diameter piping) leads off to the distributor mounted either on the end of a cam or the crankshaft. Small bore piping connects the distributor to the injectors. Set in operation, air at 550 psi enters the feed pipe from the storage tank and passes along the main trunk to the injectors and down the branch line to the distributor. Air in the

(Continued on page 180)

BLADES

AND CUTTING EDGES *of Superior Quality by*

Shunk

For all makes and types of road building and road maintaining machines. Also —

BULLDOZER BLADES
BUCKET LIPS
PATENTED SCARIFIER and ICE and SNOW REMOVAL BLADES
MOLDBOARDS
SCARIFIER TEETH

All widths, lengths, and thicknesses; accurately punched to fit your make of machine.

Write for bulletins and other information.

ALLIED EQUIPMENT MANUFACTURERS ENGINEERS

Shunk MANUFACTURING COMPANY

Established 1854
BUCYRUS, OHIO.

'US' on-the-job power cuts costs

Where high line power is not available, "U.S." power plants can speed your work—cut your costs. *Whatever* your electric plant needs, there's a "U.S." unit to fit the job.

Write for information

US UNITED STATES MOTORS CORP.
356 Nebraska St., Oshkosh, Wis.

"To E.B. or not to E.B.?"

. . . That, as the late Mr. Shakespeare might have put it, is the $64 question!

"Should I shoot from the *bottom* of the holes with electric blasting caps (E.B.'s), or shoot from the top?" asks the blaster.

"Judging from that Atlas book of machine-gun blasting photos, shooting from the bottom with the Atlas ROCKMASTER® System could give better breakage—more control and less backbreak, too. It's a fact that along with containing the explosives force and keeping it working on the burden, blasters get a reduction of noise and vibration with the ROCKMASTER System.

"Safety? Underground coal miners use more E.B. caps than anyone else. And they *tamp* the dynamite while the caps are in the hole.

"Sure, there are places where you *should* shoot from the top—if you *want* throw or want to *lift* the top out of the way, as in ditching and some tight work. But most mine, quarry and construction men want to break up the rock and pile it for the shovels.

"The Atlas machine-gun camera book is right. ROCKMASTER confinement of explosives energy gets more well-broken rock per dollar, and reduces noise and vibration."

With ordinary blasting: Geysers of wasted gas . . . unnecessary throw

With ROCKMASTER blasting: Explosives gas confined . . . controlled action

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

WELLMAN
easy handling of large stones

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts?
Send for free descriptive bulletins.

THE WELLMAN ENGINEERING CO.
7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

STONE AND WOOD GRABS • CLAMSHELL, DRAGLINE, CUSTOM-BUILT BUCKETS

Cut Costs!
with **ONAN** *portable*
ELECTRIC PLANTS

MODEL 3CK
3,000 watts A.C.
5,000 watts D.C.
with carrying frame
or dolly-mounted

Take 'em Anywhere!

Increase your profits by using fast-working, cost-cutting electric tools on every job, even where highline power is not available. Lightweight, sturdy, Onan engine-driven electric plants supply instantly-available power *anywhere* for lights, drills, saws, pipe-threaders, planers, spades, tampers, repair-shop tools and other motor-driven equipment. Carry 'em, wheel 'em, or truck 'em right to the spot and plug in for all the power you need. Equipped with carrying handles or dolly-mounted.

Lightweight Air-Cooled Models: A. C.—400 to 3,000 watts. D.C.—750 to 5,000 watts. Heavy-duty models to 35,000 watts.

Write for Free Folder!

Onan PRODUCTS

D. W. ONAN & SONS, INC.
6782 University Ave. S.E., Minneapolis, Minnesota

(Continued from page 178)

branch pipe is then routed by the distributor along one of the relay pipes to one of the injectors where it enters the valve and forces down a piston which, opening the valve head, allows air from the main trunk line to pass into the engine cylinder. By the time the cylinder's power stroke is complete, the distributor disk has rotated and the pressure in the relay pipe is exhausted freely. The injector valve then closes, cutting off the flow of air from the main trunk, the actual closing load being carried by a return spring. Meanwhile the compressed air in the engine cylinder escapes through the normal exhaust boring. The distributor disk still rotating has already reached the point where the whole cycle begins with the next cylinder. The injector valve body is an iron casting, but piston and valve head are of steel. The main valve can be lifted when necesseary and rotated so that foreign matter can be cleared from the seat without the necessity of stripping down the valve. The system is already in use on many special engines.—**The Hymatic Engineering Co. Ltd., 6-10 Whitefield St., London, W. 1, England.**

PORTABLE BOLT CUTTER—The Model 30-MCC Manco mill-type bolt cutter has blades not unlike double-edge razor blades, to give at least double the blade life of conventional cutters. These cutting blades are reversible, can be resharpened readily when necessary, and the drop-forged steel handles are guaranteed by the manufacturer against breakage. Capacity of the cutter is ½-in. bolts or ⅜-in. steel rods. Fulcrum bolts and an eccentric head strap maintain tension, and sections require only one wrench for quick adjustment. Handle assembly, cutterhead assembly and jaws by pair are interchangeable with standard 30-in. bolt cutters.—**Manco Mfg. Co., Bradley, Ill.**

REINFORCED ROOF FABRIC — Looking for all the world like fly screening, a reinforcing fabric of fireproof Fiberglas threads is recommended for roof leaks, coatings and for waterproofing areas around flashings, chimneys, skylights and firewalls. Trademarked as No-Rot, its sieve-like mesh enables the coating to bind firmly to the surface below, as well as to the membrane itself. As its name indicates, it is impervious to rot or decay, has exceptionally light weight and high-tensile strength. Developed especially for use with both grades of Monroe Rufferseal roof coating and Rufferseallit plastic cement, it is extremely flexible and can be fitted snugly around corrugated surfaces, pipes, and into sharp corners to form a tight waterproof seal.—**The Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio**

THROWAWAY BIT—The DBT Throwaway bit, as its name implies, is a one-pass bit, made so inexpensively that it can be thrown away when worn out, instead of being resharpened. Made by a veteran manufacturer of rolls and machinery for the iron and steel industry, the line of forged steel disposable bits for the heavy construction industry is said to permit faster drilling, assuring a smooth, clean hole and longer bit life. Bits are made in a size range from 1¼ to 2⅝ in. In addition, the company supplements the line with hollow steel drill rods of carbon-manganese-silicon steel, designed for use with the DBT Throwaway. A newly formed subsidiary known as the Drill Bit & Tool Company will handle sales of the new product in the U. S. and South America.—**Drill Bit & Tool Div., Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh 3, Pa.**

DIESEL PILE HAMMER—A self-contained diesel pile hammer has joined the Syntron line. Identified as No. 3000 DPH and operating on the diesel principle, the hammer does not require auxiliary power, such as air compressors or steam boilers. The force of each blow is remotely controlled by the operator—from non-impact idling to full power—through a hydraulic system. The hammer can be handled easily by crane or furnished complete with rig, leads and hoist engine to drive sheet steel, timber or concrete piling. It operates at 110 blows per min and its 1,200-lb ram delivers 3,000 ft-lb per stroke. It is 9 ft long, 18 in. wide, fits 18½-in. leads and weighs 3,000 lb.—**Syntron Co., 328 Lexington Ave., Homer City, Pa.**

GAS AND OIL BURNER—A new combination oil-gas burner that takes the worry out of possible fuel shortages is available for the complete line of Thermobloc industrial type forced warm-air, direct-fired heaters. The combination burner permits instantaneous changeover either way with no piping or burner changes. The changeover may be automatic or with manual pushbutton. Burners can operate for the better part of a heating season on the more economical fuel available with changeover occurring whenever necessary. The new burners have been extensively installed in the Kansas City, St. Louis and Ohio areas where users enjoy a "dump-load" rate. Limited gas supplies in these sections of the country have meant that no new straight gas heating loads could be imposed on the line. Gas companies permit this type of installation, according to the manufacturer, because they can feel free then to shut off supplies at any time without imposing hardships on users.—**Thermobloc Div., Prat-Daniel Corp., South Norwalk, Conn.**

Consult **BLAW-KNOX *FIRST***

before your plans are drawn on engineered construction jobs

• EVEN BEFORE the plans are drawn . . . *before* the blueprints are made on your next engineered construction job, call in Blaw-Knox engineers for the expert consultation service that assures lower concrete placing costs.

Blaw-Knox engineers are backed by over 40 years experience in solving tough or unusual concreting problems. They are trained to get to the core of your problem and find the simplest, least costly method of solving it. They can suggest operating procedures to speed the job, or cut down the necessary number of operations. They will recommend the most efficient forms for the job and help you estimate your bids.

Whatever your concreting problems—dams, tunnels, bridges, even small sewers—take advantage of the Blaw-Knox engineering service *before* you start to plan. Write, wire or phone for information.

Preliminary planning plus BLAW-KNOX STEEL FORMS saved one costly concreting operation

• This big tunnel job is a typical example of how early consultation pays off. Blaw-Knox engineers showed the contractor how to combine the collapsible Steel Forms to permit concreting of side walls and roof arch in one operation. One step in construction was saved, and the necessity of using an expensive copper water stop was eliminated.

WRITE FOR BULLETIN 2035

Get complete details about Blaw-Knox Steel Forms and the consultation service that is available to any contractor without obligation.

STEEL FORMS

CONSULTATION SERVICE BY

BLAW-KNOX

BLAW-KNOX DIVISION of Blaw-Knox Company

2086 Farmers Bank Building, Pittsburgh 22, Pa.

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NEW EQUIPMENT BRIEFS

A **positive-action belt-trainer** that automatically keeps wandering conveyor belts aligned is now being manufactured by the **Rapids-Standard Co., Inc.**, Grand Rapids, Mich. The device eliminates down-time, wear and excessive maintenance costs. It can be put on any make conveyor that has its return belt exposed under the bed, and doesn't interfere with normal operation.

A new tool designed for cutting channels in walls and floors for installation of electric, gas and water connections is now under manufacture by **Messrs. Cox Geelen,** Koningsplein 63, Maastricht, Netherlands. It's a **steel gouge,** one end of which is in the shape of a semicircular slot 1⅛ in. wide. With a hard steel cutting edge on one end and a hammer head on the other, it is said to replace normal chisels for slot cutting, and will not damage even light interior walls. Total weight is less than 1½ lb.

Darco Industries, Inc., Culver City, Calif., has set up a record for continued use of a tap—8,000 times—and the credit goes to **Lubri-Cut,** tap and drill lubricant. The tool performed blind hole tapping of standard threads to a Class 3 tolerance in aluminum alloy castings, and the manufacturer says that it works effectively for most machining operations on all ferrous and non-ferrous metals, plastics and glass. Manufactured by **Tap & Drill E-Z Corp., El Segundo, Calif.**

Armstrong Cork Co. of Lancaster, Pa., has added an incombustible, perforated, mineral **acoustical tile** to its line. Made from mineral wood and binding agents, Minatone is perforated with 676 holes in each square foot and factory painted with two coats of white latex resin paint on the face and bevels. Tiles are 12x12x ⅝ in. and installed by cement application or mechanical suspension.

A new **portable stud welder** has been added to the Graham line which requires only an electrical outlet of 110-, 220- or 440-v ac current. The "3000" welder, product of **Graham Mfg. Corp.,** 1643 National Bank Bldg., Detroit 24, Mich., has less wastage pull than a domestic flatiron.

A chemical called **Mabros 66** is added to lube oil and grease at the rate of ½ oz per 5 qt and used in gas or diesel engines to increase oiliness, up performance, prevent sluggishness, carbon, gum and sludge. Containing 100% detergent properties, it's made by **Phillips Scientific Laboratories,** 23-E Garden Terrace, N. Arlington, N. J.

A **non-mortising type hinge** is being distributed exclusively by the **No-Mortise Hinge Corp.,** Bound Brook, N. J. Its distinguishing feature is that no recess is needed to accommodate it, the hinge screws to the door and frame, eliminating all mortising and chiseling. The outer and larger leaf of the hinge is screwed to the frame, while the smaller, inner leaf is screwed to the door. When the door is closed, the smaller leaf of the hinge fits into an area cut out of the larger one. Available in standard sizes of 2, 3 and 4 in., in standard finishes, with loose or tight pin.

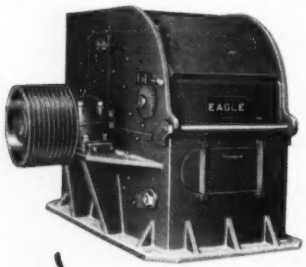
A new type of **electric ceiling ventilator** is being produced by **Indola N. V.** Westeinde 86, Voorburg, Netherlands. It has a small switching apparatus for adjusting the ventilator to five different speeds, as well as on and off. Switchbox holds a choke coil instead of the customary condenser, and the motor has a two-wire instead of three-wire connection, allowing use of normal light mains. It comes with three different lengths of propeller blades, made of transparent synthetic resin to avoid shadows and resist effects of tropical climates.

MAYBE YOU, TOO, OUGHT TO CONSIDER

EAGLE EQUIPMENT

When state highway departments have "fleets" of these loaders—using them the year 'round for loading any loose material from windrows or stockpiles—it indicates a degree of satisfaction which merits your attention. These dependable loaders are one-man operated, load from 3 to 5 yards per minute and get from job to job at highway speeds.

Just pin this ad to your letterhead, send it in, and we'll send you detailed specifications promptly. Check here ☐.



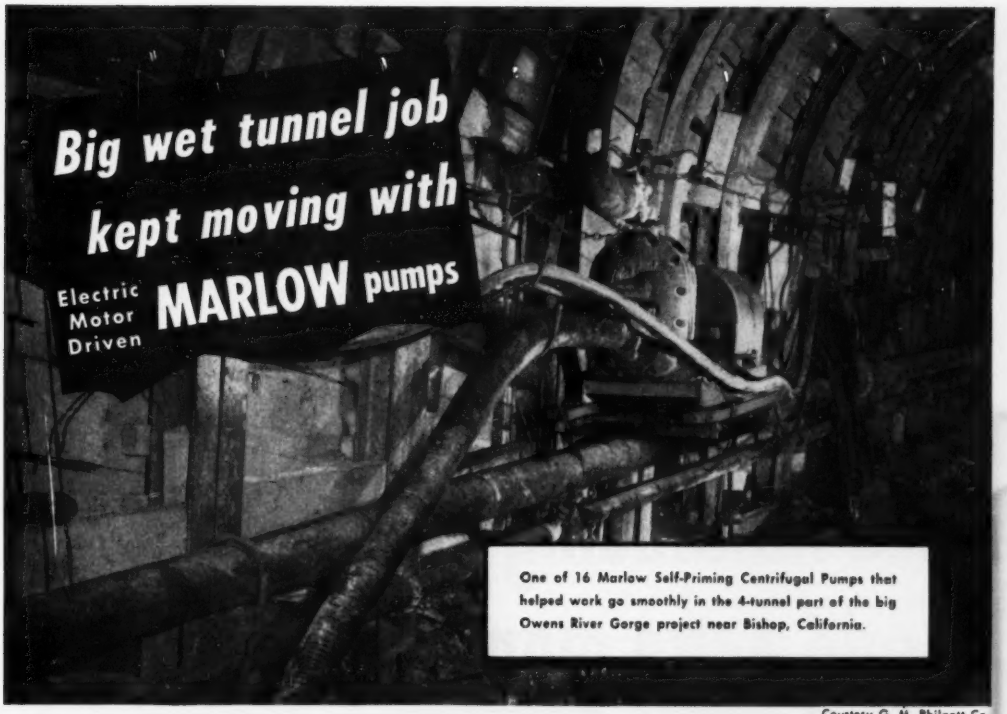
MODEL 36-42 HAMMERMILL

For uniform high rated output for easy access to replace wear parts—there's no mill that's the Eagle's equal. For many applications it would pay you to consider having Eagle crushers right on the job.

Tell us about your problem and let us send you detailed specifications. Check here ☐.

EAGLE CRUSHER CO., Inc. GALION OHIO·U·S·A

JAW CRUSHERS · IMPACT BREAKERS PULVERIZERS · CONVEYORS · LOADERS



One of 16 Marlow Self-Priming Centrifugal Pumps that helped work go smoothly in the 4-tunnel part of the big Owens River Gorge project near Bishop, California.

Courtesy G. M. Philpott Co.

Marlow electric motor driven Self-Priming Centrifugal Pumps — 16 of them — were used by Owens Tunnel Contractors to help keep water out of the way during tunneling on the Owens River Gorge project. The four tunnels varied in length from 1/3 mile to 7 miles . . . long hard digging. Two of the tunnels were very wet but the Marlows took the flood of water in stride. With the water under control, pouring of the 10½ foot diameter concrete tunnel lining moved along on schedule . . . another success to which Marlow pumps contributed heavily.

Electric motor driven Marlow pumps are used more and more by contractors. Where electric power is available, they offer big advantages in automatic operation and lower operating costs. Electric motor or gasoline engine powered — Marlow Self-Priming Centrifugal Pumps have always been able to do more than any other pumps. The astounding new Marlows are *the greatest contractors' pumps ever built*. They prime faster and higher. They handle more water at lower cost. They are non-clogging, maintenance-free and last longer than any others. And the Marlow selection is largest — models in all AGC ratings, 4M through 240M, 1½" to 10" — plus many other models for special use.

— Catalog promptly sent —

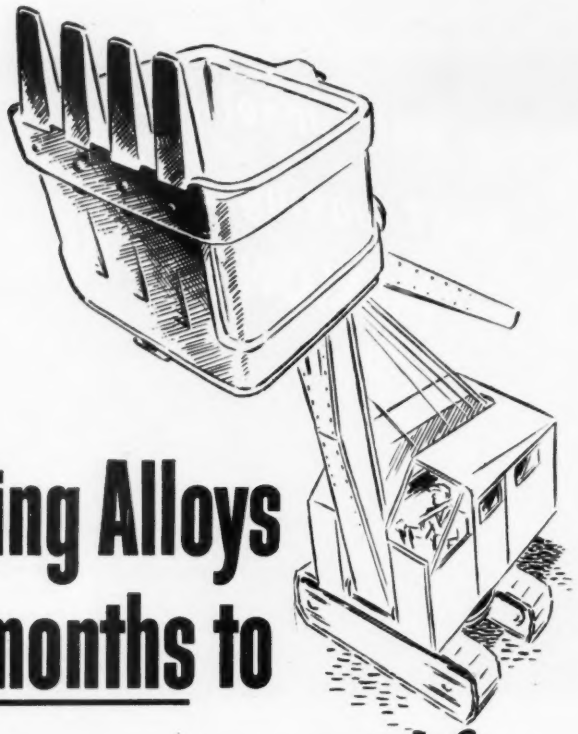
A Marlow is the only self-priming centrifugal made with a REPLACEABLE IMPELLER AND DIFFUSER. After long, hard use, they can be easily and inexpensively replaced with new ones to restore the pump to *full original efficiency*. A patented Marlow feature.

MARLOW PUMPS

RIDGEWOOD, NEW JERSEY

Manufacturers of the World's Largest Line of Contractors' Pumps Including the Famous Marlow Mud Hogs

For teeth that really chew... two to six times longer



Airco Hardfacing Alloys add extra months to construction equipment life

Today worn machinery and equipment mean more than replacement costs. Demands of the present industrial situation may require more priority than you're in a position to give.

Many foresighted construction men are hedging their worn equipment problem by insuring longer life for their present machines through the use of Airco Hardfacing Alloys . . . adding months to equipment life — and in many cases, improving the operating characteristics.

Bucket teeth are a good example. One firm found hardfacing manganese bucket teeth added two to six months working life to these formerly 'expendable' items.

But this is only one Airco Hardfacing Alloy application you can use to save time, money, and equipment. Your nearest Airco Office will gladly show you how these cost-conscious Airco Alloys will help you with your particular problem. Write today.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

AUTOMATIC ALARMS—Any individual in need of emergency alarms for conditions of liquid level, pressure, temperature, smoke or gas will be interested in the new Autocon Multalarms. A bulletin (7411) featuring the alarm shows multiple-station panel units which provide three-way protection. One important feature of the instrument is an automatic reset that eliminates human error and provides continuous visual indication until the emergency condition is corrected. Installations can be arranged with any number of stations and alarms. Additional information from **Automatic Control Co., St. Paul, Minn.**

RECTANGULAR STEEL BRIDGE FLOORING — Designated the IQ-35 steel bridge flooring, this latest development is made with grating parallel with traffic and transverse to traffic. In the latter type the transverse bars that the tires ride on are placed higher than the longitudinal bars, and the transverse bars are serrated to enable tires to maintain or to develop greater traction for emergency stopping. Whether laid longitudinally or transversely on a bridge, it is said to carry H20 loading (highway load of 20 tons) on a 15-in. circle up to a span of 48 in. Each unit weighs approximately 19 lb per sq ft.—**Kerlow Steel Flooring Co., 222 Culver Ave., Jersey City 5, N. J.**

LIGHTWEIGHT ROOF DECKS—This 12-p publication describes vermiculite concrete and its uses in a variety of roof construction. Highly illustrated with photos and sketches, it describes the physical properties of the concrete and specifications for several types of installations.—**Zonolite Co., 135 S. LaSalle St., Chicago, Ill.**

EXPLOSION-PROOF MOTORS — Construction details of Allis-Chalmers explosion-proof, fan-cooled and non-ventilated motors are described in a bulletin available from the company. Type APZZ, available in ratings of 3 to 100 hp, is fan-cooled. Type APKK, non-ventilated, is available in fractional hp ratings from ½ to 2. Bulletin number is 51B7286A, and can be had from **Allis-Chalmers Mfg. Co., 840 S. 70th St., Milwaukee, Wis.**

THOROSEAL *Restored* this Filtration Plant

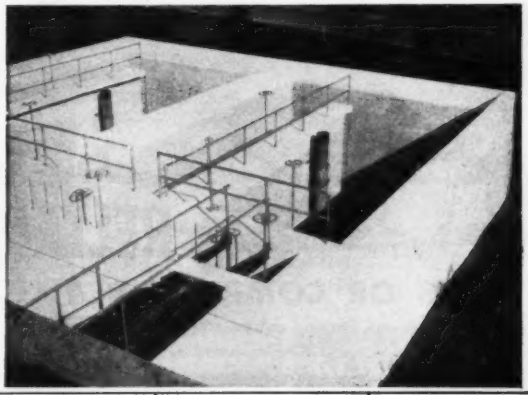
BEFORE

Example of complete break-down of masonry, due to penetration of water into body of concrete and action of frost in damp masonry.

It is amazing how THORO System products will correct a condition, such as shown in photograph. Concrete was sandblasted to remove all disintegrated material to sound concrete surface and reinforcing rods. Patching was done with THORITE Patching Mortar, bringing blistered areas to true and even lines, followed by two applications of WHITE THOROSEAL for protection.

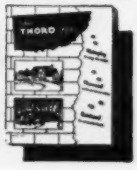
AFTER

At minimum cost, almost ⅓ the cost of other methods, concrete restoration, patching and surface protection was completed with THORO System products on Filtration Plant in Keyser, West Virginia. Contractor: Standard Construction & Waterproofing Company, of Cumberland, Maryland.



WATERPLUG	THOROSEAL	QUICKSEAL
To Stop Leaks	To Seal Surface	For Beautiful Finish

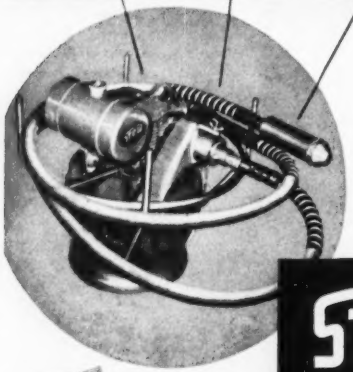
Our 20-page Brochure describes, in detail, how The THORO System products can benefit you in your construction plan. Send for brochure today, which shows methods of application and how to use the material.



Standard Dry Wall Products

Box X, NEW EAGLE, PENNA.

proven efficiency!
proven dependability!
proven on-the-job economy!



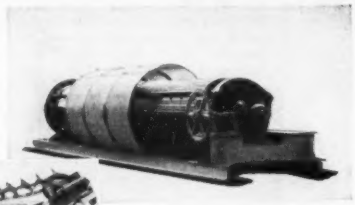
Thousands of STOW vibrators the country over are proving their value every day . . . proving their efficiency by making possible quick, perfect placement of stiff mixes . . . proving their dependability by working hour after hour, day after day under the most rugged conditions without time-losing breakdowns, without expensive maintenance.

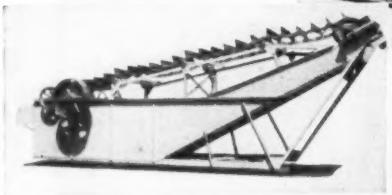
Write today or see your local distributor for a copy of STOW BULLETIN 511 and complete details on STOW concrete vibrators and screeds.

STOW GASOLINE AND ELECTRIC VIBRATORS

STOW MANUFACTURING CO.
31 Shear St., Binghamton, N. Y.

Clean sand, gravel at a cost that doesn't clean your pocketbook





Rely on RELIANCE

UNITS OR COMPLETE PLANTS

Only proper screening and washing can cut costs—and that is where RELIANCE EQUIPMENT makes its reputation. These Units have been greatly improved in the past few years and today many regard Reliance as standard for best results. Let us tell you more about their smooth operation and rugged construction. *Write for Catalog 48.*

RELIANCE PRODUCTS *still available at moderate cost*

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

UNIVERSAL ROAD MACHINERY CO.
KINGSTON, N.Y., U. S. A.
Distributors in all principal cities of U. S. A.

GRINDING WHEEL GUARDS — Stress of mobilization is forcing so many firms to employ less experienced help that this company was urged by the Safety Committee of the Grinding Wheel Institute to complete its line of drawn-steel wheel guards for portable flexible shaft and bench grinders. A new colorful parts brochure announces the complete line.—**Morrison Products Inc., 16816 Waterloo Rd., Cleveland 10, Ohio**

PHILLIE GEAR—A 4-p illustrated bulletin entitled "Power-Thrifty Products by Phillie Gear" is offered, showing the company's complete line of gears, speed reducers, flexible couplings and LimiTorque valve controls. All types and size ranges are given and the booklet is well illustrated.—**Philadelphia Gear Works, Inc., Erie Ave. and G St., Philadelphia 34, Pa.**

PRECISION INSTRUMENTS — Along with the company's complete and long established line of portable and stationary gages for measuring positive or differential pressure, vacuum, velocity and temperature of gases, are its new precision instruments. They include a new type slack-tube manometer, Visi-Float air-filter gages, hook and smoke gages. Highly illustrated with pictures and drawings, the booklet is available from **F. W. Dwyer Mfg. Co., 317 S. Western Ave., Chicago 12, Ill.**

CONDUIT PRODUCTS SELECTOR —Designed to aid electrical contractors, electricians, inspectors and maintenance men, a new two-sided box guide and raceway calculator is available from GE. It will compute easily the allowable conduit fill for various-sized rubber, thermoplastic or lead-covered conductors by a simple dialing operation. The reverse side determines the number of conductors allowed in commonly used outlet, switch and utility boxes. All tables are from the 1951 National Electrical Code. The selector, No. 18-111, is available from **Construction Materials Dept., General Electric Co., Bridgeport, Conn.**

SERVICE FOR CONTRACTORS—Any contractor interested in contract drilling service, contract shaft sinking or mining and geological consulting will want this concise 4-p booklet describing these three services available to them. The drilling service is available for periodic or long-range drilling programs. Shaft sinking crews with wide blasting and mucking experience are available for drifting and shafting, and a staff of geologists and mining engineers can help with appraisals, leases and other aids. In addition, the company manufactures various kinds of drills (portable, truck-mounted and others) which are described and illustrated. —**E. J. Longyear Co., Foshay Tower, Minneapolis, Minn.**

Mountain Moved 7 Miles @ 4½¢ per Ton-Mile

More than 4½ million tons of aggregates were used in building the Bull Shoals Dam. To obtain the rock, a mountain was leveled 7 miles away. The material moved those 7 hilly miles over Hewitt-Robins idlers *for only 4½¢ per ton-mile.*

Flippen Materials Co. acted wisely in selecting belt conveyors. They saved $560,000 on purchase *and installation* vs. a fleet of trucks, a 7-mile highway and incidentals. They saved another $375,000 in 2½ years on man-hours—a total saving of $935,000 without considering the economy of electric power over gasoline and oil. Total replacement and repair expense for Belt Conveyor Idlers was less than $2,500. Compare that with the expense of keeping 30 twenty-ton trucks (and their tires) rolling 2½ years!

Belt Conveyors offer you numerous other substantial benefits. For installation, operation and maintenance, you need a primitive dirt road—not a paved highway. You cut across grades—no winding for miles around them. Rivers, ravines and roads can be spanned with bridges *made of wood.* When tunneling is inevitable, a simple hole is adequate.

Hewitt-Robins offers three types of Belt Conveyors—engineered, sectional and low sectional—able to meet every construction-project need.

Before you bid on another highway or dam job, consider belt transportation. Send us the details, including topographical maps, for an unbiased analysis. We will tell you—honestly and factually—whether belt conveyors will save you time, trouble and money. Address Contractors' Service Dept., Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N.J.

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

HEWITT-ROBINS
BELT CONVEYORS

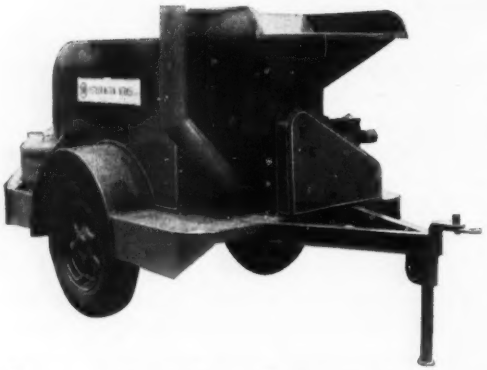
HEWITT-ROBINS HR **INCORPORATED**
STAMFORD, CONNECTICUT

Hewitt Rubber Division • Robins Conveyors Division • Robins Engineers Division • Hewitt Restfoam® Division

FIBER INSULATION—Two booklets are available on Ultralite insulation—one for insulating ducts and the other for general building construction. The first is a 16-pager about characteristics, thermal efficiency, methods of specification, density and other general information. The duct insulation is a wrap-around-type thermal insulation applied to the exterior of ducts and the duct liner is primarily an acoustical insulation to be applied to the interior of the system. The second catalog is a 6-p folder telling where Ultralite is used in transportation, metal buildings, piping applications, coolers, original equipment and heating, ventilating and air conditioning.—**Gustin-Bacon Manufacturing Co., Kansas City 7, Mo.**

SOIL COMPACTION—Detailed information, including useful new production data, for figuring work schedules and costs on soil-compaction jobs is contained in a bulletin just published by the makers of the Barco Rammer. Of special interest to builders, contractors, supervisory engineers and project managers is a discussion of the use of "soil compaction" as a means of attaining (1) greater performance, (2) lower costs, and (3) earlier completion dates on many construction projects. Applications described include use of high-degree soil compaction in construction work on highways, roads, streets, buildings and the like. Readers may obtain copies by addressing **Barco Mfg. Co., Dept. R-24, 1801 Winnemac Ave., Chicago 40, Ill.**

The Moto-Patcher



—a mobile mixing unit designed for easier, more economical road and street maintenance.

for speedy, low-cost patching

● The Moto-Patcher delivers up to 10 tons per hour of *freshly* mixed material. The aggregate may either be shoveled into the hopper, or fed into the hopper by a small elevator (optional equipment). The mixed material is deposited on a pan of convenient height for easy shoveling, or it can be dropped directly onto the road surface. The 400 gal. tank assures an adequate supply of bitumen for uninterrupted production, making frequent stops unnecessary. The mixer, running through the bitumen tank, provides a drying action for the aggregate. If desirable, bitumen may be circulated when machine is not mixing.

Bulletin MP-51, giving specifications, flow diagram and complete information, will be sent on request.

H&B ESTABLISHED 1883

HETHERINGTON & BERNER INC., 735 Kentucky Avenue, Indianapolis 7, Indiana

PLASTIC PIPES—This 16-pager is full of useful information on various Carlon pipes, tubing, fittings, and well casings. Physical properties, chemical resistance, working pressures and specifications of each are included; also lists of fittings and accessories for each type, broken down into separate reference units.

One type can carry safely liquids for consumption, another cannot; one is affected by the freezing of water it carries while another is not. Types EF, E, C, TL and T are all described fully, and the booklet ends with eight special points of caution.—**Carlon Products Corp., 10153 Meech Ave., Cleveland 5, Ohio.**

HEAT MACHINES—Fageol heat machines are independent, self-contained, portable heating units that utilize the most economical method of heat transfer and direct heat circulation. No ducts or oil pipes are required. Simply plug the heat machine into any regular electrical 110-v outlet and a large capacity gun-type pressure-atomizing oil burner is set into motion. It operates on No. 1, 2, or 3 fuel oil or kerosene. Room air is drawn in by a blower at the top of the unit and is forced down over and around the heat exchanger. It is heated instantly and then blown out directly and gently at floor level. The unit also is recommended for preheating tractors, power shovels, and any type of construction machinery, as well as for drying, treating or curing plaster, paint, concrete or new concrete pours.—**Fageol Heat Machine Co., 5725 Mt. Elliott Ave., Detroit 11, Mich.**

PURE WATER AT LOW COST—Dearborn De-Ionizing systems make possible mineral-free water in any desired quantity at a fraction of the cost of commercially available distilled water. Given a mineral analysis of a local water supply, along with information on intended use of de-ionized water, quantity of same, available pressures and electric power characteristics, Dearborn engineers can recommend a system most suitable for your requirements. Ask for Bulletin 5005, available from **Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.**

WOOLDRIDGE TERRA COBRAS—The new Wooldridge Model TC-S142 Terra Cobra self-propelled scraper is described in an 8-p bulletin just released. Operational features and mechanical details are shown in a series of sectional, cutaway and assembly views. The machine has a heaped capacity of 17.5 cu yd and is powered by a 225-hp Cummins diesel engine. Ask for Bulletin No. TC-707.—**Wooldridge Mfg. Co., Sunnyvale, Calif.**

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CONTINUOUS THREADED COIL RODS . . . . MAKES DIFFICULT TYING JOBS *Easy* . . . . .

Superior Continuous Threaded Coil Rods, with or without Coil Wing Nuts and Corner Brackets, are a valuable supplement to Superior Coil Ties and standard working parts when job conditions are unusual or difficult.

In three typical applications, shown at the right, these Continuous Threaded Rods are used; (1) to tie form corners; (2) as an anchor rod tie down and as coil bolts; and (3) as a coupling for two coil ties providing an adjustable form tie.

Available in ½", ¾", and 1" diameters and in any length up to 10 ft., Superior Continuous Threaded Coil Rods in quantities can be cut to length on the job with a heavy-duty hand Coil Rod Cutter.

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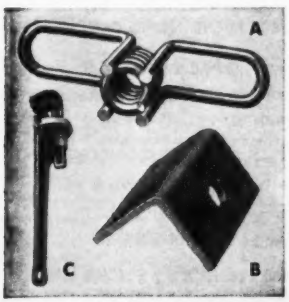

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An *exclusive* Superior feature. Provides simple, efficient method of tying form corners and bulkheads.

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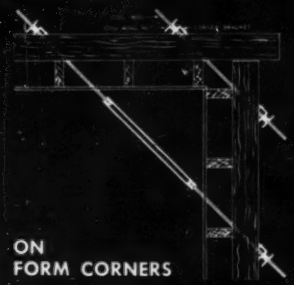
Heavy-duty Stillson type wrench with special jaws for gripping and turning Coil Rods with least damage to threads.



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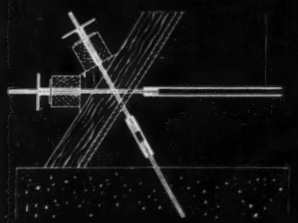

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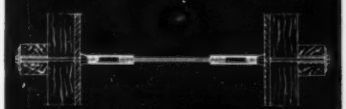

AS AN INTERNAL TIE
Two Coil Ties and a length of Coil Rod make an adjustable form tie and spreader.

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REQUEST A COPY OF OUR NEW CATALOG 500 . . .
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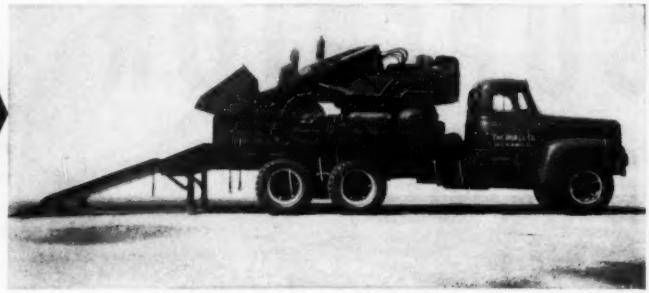

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HERE is a heavy duty flat bed International truck for general hauling, *equipped also to transport the International TD-9 tractor that goes with it!* Removable steel ramps and a 20,000 lb. winch make it possible for two men to quickly and safely load or unload the tractor.

The tractor is equipped with a cubic yard hydraulic-controlled shovel and interchangeable bulldozer blade, 38"x84".

This rugged combination unit is highly efficient and practical—developed and field-proven by The DoALL Company. It may be inspected at Des Plaines, Illinois, 20 miles northwest of Chicago.

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Frank W. Campbell, The DoALL Company
Des Plaines, Illinois
Call: VAnderbilt 4-1122

DoALL

SPECIFICATIONS

TRUCK: International LF-192; 175" wheelbase; 6 cyl. gasoline; 45.9 HP, develops 154.2 HP; overall length 26'-10"; steel platform 96" wide x 14' long; weight 15,720 lbs.; maximum load 25,000 lbs.; 6 wheels; dual rear axles and differentials; 12 ply rock lug tires; double frame; increased cooling capacity; increased capacity brakes; auxiliary transmission; oil filter; dual 31 gal. gas tank; fresh air heater, defroster; oversize battery; power divider lock; tow hook front and rear; Gar Wood 3MB 20,000 lb. winch with cable.

INTERNATIONAL TRACTOR: Model TD9-400-2 Diesel crawler tractor; 40.5 drawbar HP, 48.5 belt HP; 60" tread; extended oscillating track frame; large diameter front idler; 15" overlapping flat shoes with low profile bar; electric starting and lighting; 2 speed reverse transmission; equalizer bar and cradle; blower fan; front power take-off coupling; crankcase guard; muffler; collector type pre-cleaner; clutch driven member assembly with bonded facings; hour meter; equipped with Model 9 bulldozer shovel with 74 inch wide, one cubic yard bucket with hydraulic bucket control; bulldozer blade 38" x 84" to interchange with bucket.

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Complete With Motor

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(Classified Advertising)

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NEW ADVERTISEMENTS: Address New York office, 330 W. 42nd St., N. Y. 36 for the June issue closing May 23rd.

Additional "Searchlight" Advertising on the opposite page.

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WITH FORMULA NO. 640. A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
Haynes Products Co., Omaha, Neb.

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4—6 Cyl. CUMMINS Model H1 Diesel Generator Units, 90 HP, directly connected to 25 KW 31.2 KVA Generators, 3/60/120/208 volts, 4 wire. All in excellent condition having been in operation very little. Price $2500.00 each

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GENERAL MACHINERY & EQUIPMENT CO.
140-44 S. 17th ST.
HARRISBURG, PA.

FOR SALE

2—Steam Locomotives Yard Type 0-4-0

1—Turbo-Generator Set 250 V. 400A-DC

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1—Centrifugal Pump with 7½ HP, 440 V, 3 Phase Motor, 200 G.P.M., 90' Head

NEW—Jack Bits $2 for 1¼" Drill Steel

DUKE POWER CO.
CHARLOTTE, N. C.

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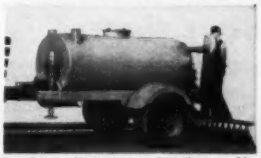
GRACE Asphalt and Compaction Equipment

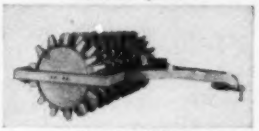
3 sweeper models, axle, engine or tractor powered.

Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.

Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Sheepsfoot Rollers 250 to 600 psi.

Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.
6100 S. Lamar Dallas, Texas

What Happens-

—when one contractor tells another about the

STANDARD RB ASPHALT PLANT

Talk about chain reactions! One contractor telling another about *Standard's* RB Asphalt Plant generally results in a new sale. At least that's how it has been working out in section after section recently. They just *can't* seem to say enough good things about the *Standard* RB's ruggedness, smooth performance, high capacity and all-around ability to make money.

Take the central New Mexico area, for instance. Less than six months after the first *Standard* Plant was installed there, 8 more had been ordered inside a 100-mile radius! The same goes for New Jersey, where two orders were placed *within 30 days* after the original *Standard* Plant went into operation. Yes, the *Standard* RB has what it takes. Ask the man who owns and operates one.

UNIT BUILT — 8 SIZES, 500 TO 6,000 POUND BATCH CAPACITIES
WRITE TODAY FOR FULL DESCRIPTIVE LITERATURE

STANDARD

STANDARD 50 YEARS

STANDARD STEEL CORPORATION

5089 Boyle Ave., Los Angeles 58: 123-89 Newbury St., Boston 16

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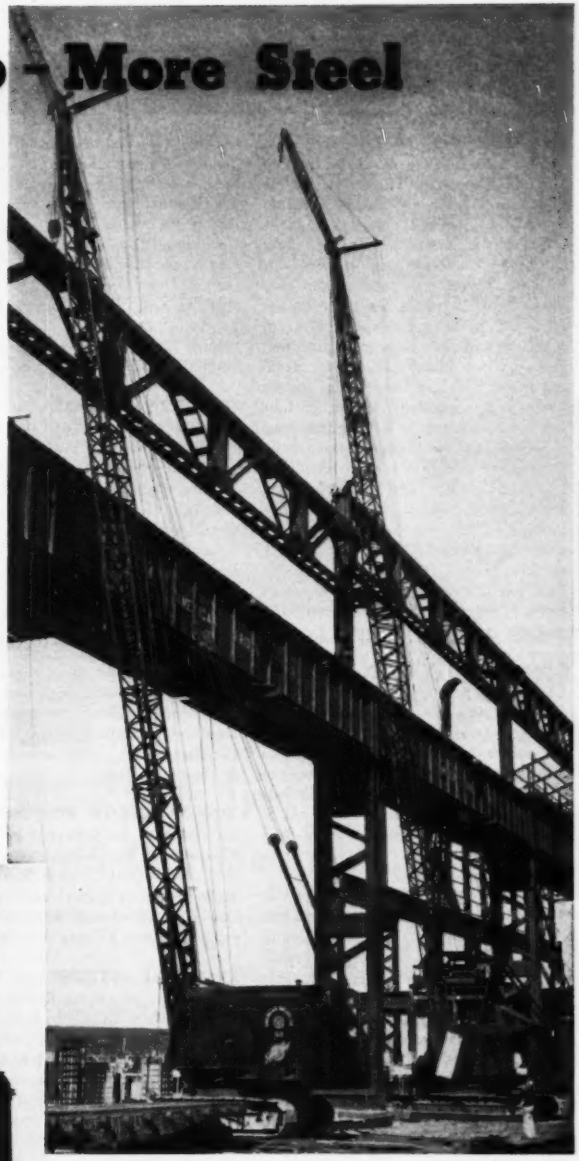
Coming Up - More Steel

23 Manitowocs Speed Construction at U. S. Steel Fairless Works

On this huge Pennsylvania project 23 Manitowoc Cranes and Draglines, more than any other make, are carrying the brunt of the work excavating and steel erecting for the major contractors.

Such preference means only one thing, satisfactory performance—ability to handle heavy loads, high up with pin point precision and utmost safety.

And on most other major projects whether it be earth excavation or steel erection you'll find those big, husky Manitowocs handling the toughest parts of the job. They'll handle *your* job too. Manitowoc Engineering Works, Manitowoc, Wisconsin.



American Bridge uses a Model 3500 and a Model 3900 Speedcrane to set a heavy girder for the Open Hearth building. Reach plus stability means speed and safety.

Model 3000 with 90 foot boom sets steel on second blast furnace for Arthur G. McKee, contractor.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

Methods Memo . . .

WE HAVE BEEN INFORMED that construction men pay taxes the same as other U. S. citizens. Two revealing bits of tax arithmetic may help us regain solid footing in our thinking.

There is much talk in Congress about cutting the President's budget by various billions, depending upon whom you read. How do totals one way or the other affect the individual? Let's put it this way: It has been calculated that for each one billion dollars cut from the Federal budget for 1952-53, on the average, an American family of four can keep $25 more for its own purposes.

The word billions has become commonplace in everyday conversation. How big is $1,000,000,000? Well, it takes 1,000 thousand-dollar bills to make one million dollars. Stacked in a pile when new, the pile would be 8 in. high. A stack of enough thousand-dollar bills to total one billion dollars would be about 110 ft higher than the Washington Monument!

RUSSIANS DO IT AGAIN. The Barber-Greene Company reports that the Soviet Union reports yet another triumph of its engineering genius, the development of an asphalt finisher. Their newest feat is said to bear a striking resemblance to the B-G Model 879-A Finisher, various models of which have been used by U. S. and foreign contractors for more than a decade.

LUMBER FOR SCHOOL CONSTRUCTION is urged by the West Coast Lumbermen's Association to offset delays in waiting for critical building materials and to provide the school structures needed so badly in many communities. The lumbermen point out that most school buildings now are one-story and that extra exits are planned easily for emergency uses. They note also that most fire casualties are the result of suffocation or panic—even in so-called "fireproof" structures where the contents may burn.

BUILD AND LEASE is the plan of the Thompson-Starrett Co., New York contractor, in the proposed construction of a $3,000,000 hangar at Cleveland's Hopkins Airport. The hangar, of multi-purpose design, would cover 15 acres and would be financed by the contractor. Then Thompson-Starrett would receive $225,000 annually in rent for 25 yr following construction, after which the hangar would become the property of the city.

RENEGOTIATION REGULATIONS under the Renegotiation Act of 1951 have been put into effect. Contractors are expected to obtain copies for themselves. So far they have been printed only in the Federal Register, issue of March 25. Copies are available from the Superintendent of Documents, Government Printing Office, Washington, D. C. A handbook is planned, to be supplemented with a service to keep the information current.

DEATH IN A TUNNEL came to 40 workmen in an explosion that occurred in a branch tunnel almost 3 mi long and part of the hydro-electric plants of the Volturno-Garigliano River in Italy. Almost all of the men working in the middle of the tunnel were asphyxiated although air displacement killed some, and 57 were injured.

The contractor claims that a small charge of explosive used to smooth the walls brought on a sudden eruption of natural gas that spread through the tunnel and became ignited. The workers charge that the firm kept unduly large stocks of explosives in the tunnel to accelerate construction. The contractor, the Farsura Co., holds records in Italy for fast tunneling.

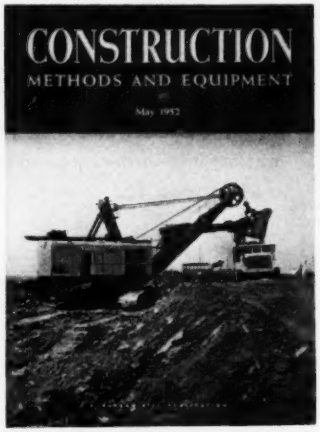
TOO MUCH LOW BIDDING by contractors may be indicated in a recent "Review" by Dun & Bradstreet. It states that construction failures in 1951 were more numerous than at any time in the last 17 yr. All other industries and trades reported fewer failures than in 1950.

INCENTIVE SYSTEMS have been vindicated, if the recent decision by the 15-judge U. S. Tax Court in the Lincoln Electric Co. case is a barometer. Lincoln's worker-incentive plans had been questioned by the Commissioner of Internal Revenue and litigation started in 1942. The company produced evidence showing average worker-productivity increases of 15.3% a year, wages double those normally paid in industry and prices of products reduced by about 50% over the last 18 yr.

THE NATIONAL APPRENTICESHIP PROGRAM for 1952 is explained in a booklet of that title by the U. S. Department of Labor, Washington 25, D. C. It explains how apprenticeship programs are established, shows the workings of management-labor apprenticeship committees and lists the occupations in which training is given.

BIG MONEY FOR HIGHWAYS is advocated strongly by Paul B. Reinhold, president of the American Road Builders' Assn., to overcome the huge backlog due to neglect of roads during the war and to build new roads needed to cope with the country's ever-expanding traffic.

Reinhold favors the spending of $3 billion annually on highway improvement for the next 10 yr to amortize a $32 billion need. He opposes the idea of a special layout of military highways. Instead, he maintains that an adequate network of modern arteries for peacetime transportation can be converted readily to military purposes in time of emergency.



On the Cover

A monster feeds The Monster. Down on the Wichita Air Base the new Marion 191-M 10-yd shovel loads the big 600-hp Euclid 38-yd (heaped) end-dump in three passes for Western Contracting Corp. Both rigs will end up at Western's Ft. Randall Dam job on the Missouri in South Dakota this spring.

The Marion shovel was described in detail in our issue of March 1952, page 75. The machine shown on the front cover is diesel-electric, but two more on order from Western are all-electric. These, plus a fleet of 30 big Euclids, will give the contractors a formidable array of earthmoving equipment. Marion now offers the big shovel as part of its regular line.

An article on this Euclid Monster appeared in CM&E, June 1951, page 104. It also was the subject for Picture of the Month last November, page 37.

City Park Garage, Pershing Square, Los Angeles, Calif.; Archt. Stiles Clements, Associated Architects & Engineers; Consltg. Engr.—Murray Erick Associates; Contrs.—Ford J. Twaits Co.; Morrison-Knudsen Co., Inc.; and T-S Construction Engineers, Inc.; 50,000 Cu. Yds. of Pozzolith Ready-Mixed Concrete Supplied by Graham Brothers. All companies of Los Angeles, Calif.

POZZOLITH READY-MIXED CONCRETE In World's Largest Underground Garage

To a long list of outstanding structures built with Pozzolith Ready-Mixed Concrete has been added this 2000-car underground garage.

Use of Pozzolith Concrete assured designed strength . . . also resulted in quicker re-use of slab shoring material — reducing costs and speeding up work; good concrete surface — holding down finishing cost of slabs.

Pozzolith's cement-dispersing, water-reducing and air-entraining action (making available the optimum amount of air) produces these further benefits:

1. Reduced Shrinkage — for less cracking.
2. Lower Permeability — for less "waterproofing". . . later.
3. Increased bond-to-steel — for better construction.
4. Greater Durability — for lower maintenance costs.

Full information and Pozzolith booklet on request.

Over 600 Leading Ready-Mixed Plants Are Producing Pozzolith Ready-Mixed Concrete

CEMENT DISPERSION ALSO KEY TO SUPERIORITY OF THESE MASTER BUILDERS PRODUCTS

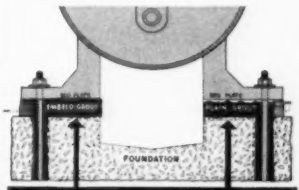
MASTERPLATE . . .

Masterplate produces "iron-clad" concrete floors with 4-6 times longer life; also spark-resistant and static-disseminating. Non-colored and 11 colors. For new floors and resurfacing.

Section of Masterplate Floor. Note Thickness of Armored Surface.

EMBECO . . .

Embeco (1) produces flowable, **non-shrink**, ductile grout which . . . (2) gives full, level, **lasting** bedplate contact . . . (3) helps avoid costly shutdowns.



EMBECO Grout Is Non-Shrink | Plain Grout Shrinks

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

300,000 YARDS

maintenance still too low to be figured

Two of the eight Worthington Blue Brute Wagon Drills that broke cost records for Rock Construction Corporation. Note the amount of line drilling.

President Walt Dunham and Engineer A. Bruce Lattanzi in the company's Downsville Dam office.

Two 500[1] Worthington Blue Brute Air Compressors supplying air for drills at the Downsville Dam.

Line drilling in blue stone is child's play to those Worthington Blue Brute Wagon Drills.

Rock Construction Corporation of Kingston, New York, working on the Downsville Dam weir and waste channel, got service out of eight wagon drills that constantly amazed them.

Walt Dunham, president, reported: "We have drilled as much as 700-800 feet per 8-hour day per machine. In 165 working days, the machines put out 300,000 cu yds with so little maintenance it can't be figured in cost per yard."

This job also used a number of Worthington Blue Brute Hand-Held Rock Drills. Says Mr. Dunham: "There has been absolutely no maintenance cost. Our operators like them better than anything they have ever used."

Worthington Blue Brute Rock Drill operating ahead of the wagons collaring hole for laying out line drilling.

Contractors everywhere know that a Worthington Blue Brute team—air compressor and tools—makes mincemeat out of even the toughest jobs. See your nearby Worthington distributor for a demonstration. Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, N. J.

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB